



# NEWS IN BRIEF

## ANSI Cobol for Criterions

THE long-promised ANSI 1974 Cobol compiler for the NCR Criterion machines has been released in the US and should be arriving in the UK early next year. The compiler was originally announced with the Criterion (CW, April 22, 1976), and scheduled for worldwide release about now.

An NCR spokesman admitted that release had been delayed but declined to give any reasons.

## Zilog marketing

EUROPEAN marketing responsibilities at Zilog have been taken over temporarily by Bob Sims, vice-president of marketing for the company, following the death of Vic Yates (CW, November 3). Sims will operate from Zilog's European headquarters at Maidenhead, from the end of November.

## Mididisc

AN ultra-compact disc sub-system for the desk-top systems builder has been introduced to the UK market by CII-Honeywell Bull. Developed to produce a disc unit comparable in size to the compact processors now available, it is called the Mididisc and will be available in 10 and 20 Megabyte units.

## Luck of the draw

DELIVERIES of IBM's 3031 and 3032 processors are to be scheduled by the luck of the draw in the same way as 3033 deliveries (CW, June 23). Among the customers "going into the hat" will be Derbyshire County Council, which wants a 3031 to replace its 370/145.

## Cutting costs

THE National Office Reprographic Exhibition will take place from February 14-18 at the Wembley Conference Centre. It is organised by the Business Equipment Trade Association. Aim of the conference is to help the business world cut costs in all departments. Further details from BETA on 01-405 6233.

### TPS THE LEADING TP MONITOR FOR ICL MACHINES

- ★ smooths the path to on-line systems from the simplest beginning to the most advanced development
- ★ gets more out of your current machine giving unmatched performance on your 2901, 2904 or 1000
- ★ carries you forward to your new machine directly to DME or to VME by TPS-CARE
- ★ has more than 70 users have been chosen by best users and by those with several years' development behind them

Keep in the mainstream of on-line systems development. Hear the reasons why at a TECHNICAL PRESENTATION Oxford, 8th December. Write or telephone for your complimentary ticket to TELECOMPUTING LIMITED Seaforth Tower, West Way, Oxford (0866) 723621. Telex: 837276

# RTOS cancelled 'for being too good'

SOME interesting alternative explanations have emerged for Univac's cancellation of its planned Real Time Operating System.

The software, on which £10m had already been spent, was cancelled last year, in favour of improvements to the Transaction Interface Processor attached to existing 1100 OS systems (CW, November 11, 1976).

A former member of the RTOS development team told Computer Weekly last week that RTOS was cancelled because it was too good. Benchmarks had shown such a performance superiority over 1100 OS, he contended, that there was a real possibility that the latter would become outmoded. Univac was left with the choice of running down the small UK-based RTOS team, or the much larger 1100 OS force.

Univac's own accounts of its reasons for the move vary. Last year, the company said that Tip development would be more economical than continued RTOS development, but last week, user demand for an extensive batch capability as well as real time was given as the primary reason.

Univac admitted that the benchmarks in question had been performed, and had shown RTOS to be superior. But Univac believed that the improvements to Tip would make 1100 OS the superior system, and a spokesman admitted that a comparative benchmark had not since been run.

From an economic point of view, he added, supporting one standard operating system would clearly be less expensive than two, and re-training and assurance of compatibility of future product lines made 1100 OS a safer bet. Cancellation of the RTOS project has resulted in the virtual extinction of Univac's UK software development centre, which is now devoted, ironically, to performing benchmarks. Some staff have been "re-deployed" but many have left.

It would have saved time and money to have assessed the situation more carefully before starting RTOS development, he agreed, "but, after all, it's not the only development that a company has ever cancelled".

# Tesco gives £6m order to IBM

IN its biggest single capital investment, the Tesco supermarket chain is switching from ICL systems to a £6m IBM service including new 3032 and 3031 mainframes and, eventually, a point-of-sale equipment in its department stores.

Tesco's likely move to IBM was reported last month (CW, October 27).

Tesco currently has three ICL 1904S computers, an ICL 2903, and a Computer Automation Syta minicomputer system. These eventually will be replaced by an IBM 3032 with 6M bytes of main store, a 3031 with 4M bytes, an IBM 3850 mass storage system, two IBM 3800 laser printers, and 200 VDUs.

The main Tesco computer centre is Cheshunt, Herts, where the IBM system is due to be installed in mid 1978.

Explaining the switch, Donald Harris, a director of Tesco Stores, said: "ICL has its own development timescale, and this did not match our requirements, such as the great emphasis on mass storage and non-impact printers. It was a case of looking ahead to about 1984, and in doing this, IBM offered a sufficiently significant cost advantage."

Harris also said that in moving on to a more powerful system, the company was carrying out a decision made some time ago.

"About three years ago we would have liked to jump in and buy such equipment, but the



Lorraine King receives a donation of three computing courses from NCC director David Fimberg.

# Careers in computing for the disabled

TWO visitors to last week's Compec exhibition, David Fimberg, director of the National Computing Centre, and Lorraine King, chairman of the British Computer Society's specialist group for the disabled, met on the NCC stand for the courses donated by the NCC to the specialist group.

The audio-visual courses on Cobol, Filetab and the implications of computing systems are for paraplegics, and people with spinal injuries. They will give patients the chance to learn about computing and see if they have the aptitude and interest to follow a career in computing.

A machine for running the video tapes has been presented by Phillips.

Lorraine King pointed out that computing is a career which people can follow even with their disabilities, and she appealed for help with the specialist group's work, and in particular for help in finding jobs for people who complete the NCC courses.

Those who can offer help should contact Derek Nicholson, secretary to the BCS Specialist Group for the Disabled, Ludwig Guttmann Hospital, Stoke Mandeville.

# IBM to shut in India

THE Indian government has rejected IBM's proposals for restructuring its Indian operations to meet local ownership regulations (CW, September 22), and IBM is closing its business there.

The company is to sell all the machines it has on rental, dispose of its data centres and maintenance operation, and close its factory which manufactures mainly unit record equipment. It hopes to complete the sale within 180 days.

Its present and future will be confined to a liaison office which will handle authorised sales of large systems.

ICL is reducing holdings in its Indian companies to 40%, and manufacture of 2803 there is still under discussion.

# Harris launches Model 6

MORE speed and more power for less money is claimed by Harris Systems for its latest computer, the Harris Model 6 Virtual Memory, announced at Compec last week.

Up to 20% increase in processing power over previous systems in the Harris Series 100 range is claimed.

Both scientific and commercial applications can be handled, and cost of the basic 115 system is £85,000. Upgrading from this to the 125 costs about £30,000 extra and from the 125 to the 135 about £45,000 extra.

### ATLANTIC SYSTEMS 3 USERS

Flexlease is now available on System 3 — save money without sacrificing flexibility.

Atlantic Computer Leasing Ltd., 12 Chancery Lane, London WC2. Tel: 01-405 8238. Telex: 268344

### COMPUTER & MANAGEMENT EDUCATION SERVICES (Software) Ltd.

21-25 Goldhawk Road, London, W.12  
Tel: 01-743 1114

ONE OF THE MOST PROGRESSIVE SOFTWARE HOUSES

# Faster micros next year

FASTER versions of the Intel 8085 single chip microprocessor are under development, and should be available by mid-1978, according to Les Vadasz, vice president and general manager of Intel's Microcomputer Components Division.

The company is now in the final stages of developing specifications for the new 8085 variants.

Vadasz's confirmation of the improvements follows industry rumours that the company was working on developments in the performance of the device. A figure of a four times improvement in cycle times has been mentioned. If this figure is finally substantiated, it would reduce the 8085's cycle time from its current rating of 330 nanoseconds, to under 90 nanoseconds.

Similar improvements were also postulated for the 8080 microprocessor, but Vadasz effectively scotched this, saying that although higher speed versions were available through selection at manufacture, developments were planned.

Viewed by some industry observers as Intel's "reason for customers not to buy the Z80 device", it seems likely that at least one version of the 8085 will be pitched near the speed of the faster version of the Z80, the Z-80A, which has a cycle time of 250 nanoseconds.

There has even been mention that speed improvements will make the part more useful than the 8086, 16-bit microcomputer which is now scheduled for sampling early next year.

# Challenge to 3031

CHALLENGING the IBM 3031 is a new processor from Intel for the top-end of its AS/4 and AS/5 line of IBM plug-compatible CPUs. It is called the 7031 and has a maximum of 8M bytes of main memory, compared to 6M bytes on the 3031. Intel claims its total 7031 package in Europe will be 30% cheaper than the 3031. Hitachi is currently developing an AS/7 for Intel to compete with the 3033 and in Iran, where IBM is in dispute with the government, Intel is planning to enter the market.

# Worker directors

WORKERS at Computer Machinery Company are electing two new worker directors. Those elected, out of eight candidates, will attend monthly board of management meetings to discuss company planning. Voting ends on November 30, and results will be declared early next month.

# By George

THE George 3 DME environment on an ICL 2980 provides about 35% improvement over George 3 on a 19037, according to Phil Fellows, director of Vickers Management Services, which is running a pre-release version of George 3 DME. See page 3.

# Byte Shop bought

THE Byte Shop retail chain in America has been bought out by Logical Machine Corp., the California-based manufacturer of IBM and Apple computers. The Byte Shop, which had been suffering from capitalisation problems, will continue to be run as an independent business.

### ACS MANUFACTURING SYSTEMS

Packaged or tailored  
01-637 0105  
061-236 0102

# Briefing

## Suit against SEN fails

IN the High Court last Monday Data General failed in its attempt to win an injunction to stop SEN Electronics from marketing, selling and advertising its Helvet-1 minicomputer in the UK.

However, Data General says that it will continue to vigorously prosecute its action against SEN for the alleged misuse of proprietary information, even though Mr Justice Whitford said that it had no arguable case on the evidence before him.

The Helvet-1 is functionally compatible with the Data General Nova and uses a CPU from Keronix Inc of Santa Monica, California, which builds and sells a Nova-compatible machine in the US. Data General has an ongoing suit against Keronix for the alleged misuse of proprietary information while Keronix is suing Data General charging DG with conspiracy to commit arson and wire tap Keronix's telephones (CW, January 30, 1975).

## Laur Punter fails

FOLLOWING the liquidation of consultancy Laur Punter, the Euroco consultancy has confirmed that it is discussing a takeover of the company's assets. A definite conclusion has not yet been reached, said a Euroco spokesman.

## Challenge to 3031

CHALLENGING the IBM 3031 is a new processor from Intel for the top-end of its AS/4 and AS/5 line of IBM plug-compatible CPUs. It is called the 7031 and has a maximum of 8M bytes of main memory, compared to 6M bytes on the 3031. Intel claims its total 7031 package in Europe will be 30% cheaper than the 3031. Hitachi is currently developing an AS/7 for Intel to compete with the 3033 and in Iran, where IBM is in dispute with the government, Intel is planning to enter the market.

## Worker directors

WORKERS at Computer Machinery Company are electing two new worker directors. Those elected, out of eight candidates, will attend monthly board of management meetings to discuss company planning. Voting ends on November 30, and results will be declared early next month.

## By George

THE George 3 DME environment on an ICL 2980 provides about 35% improvement over George 3 on a 19037, according to Phil Fellows, director of Vickers Management Services, which is running a pre-release version of George 3 DME. See page 3.

## Byte Shop bought

THE Byte Shop retail chain in America has been bought out by Logical Machine Corp., the California-based manufacturer of IBM and Apple computers. The Byte Shop, which had been suffering from capitalisation problems, will continue to be run as an independent business.

# COMPUTER WEEKLY

Number 577 Thursday, November 24, 1977 Price 18p



LEFT: Amdahl field engineers at work on the V5 installation at Sunbury. David Hall looks on as Steve Brinkler keys in test programme.

# First UK Amdahl installed by BOC

TIME sharing and APL bureau services will be two of the most important applications for the first Amdahl processor in the UK. This was installed at BOC Data's centre at Sunbury-on-Thames, Surrey, at the weekend, and is expected to go live in about four weeks.

The Amdahl machine, a 470/V5, will effectively double BOC Datasolve's processing power, by providing the same throughput as the bureau's multi-processor 370/158 which is located at its Oxford Circus centre.

BOC Datasolve says that the TSO and APL work currently being handled by the 158 will be transferred to the Amdahl and the 158 will concentrate on CICS and IMS processing. Both machines will also run batch and RJE work.

The four Megabyte 470/V5 will operate under exactly the same system as the 158 configuration, MVS Release 3.7, and all the peripherals will be from IBM.

The 470/V5 will be maintained by Amdahl's own field engineers and Amdahl's headquarters at Sunnyvale, California, will provide real time diagnostics facilities via a dial up satellite link to Sunbury.

One of the main reasons for BOC Datasolve selecting an Amdahl machine was the quick delivery offered, but far from deserting IBM the bureau has a 3033 on order which is expected to arrive in about a year from now. A second 3033 may eventually replace the 158 at Oxford Circus.

# Neddy move could limit UK software

A CONTROVERSIAL proposal that government preference should be given to software houses which develop systems for UK minicomputer manufacturers, is being considered by the manpower resources sub-committee of the Neddy computer sector working party.

If the proposal is accepted by the Neddy council when it is discussed within the next two months, it would be another move in Neddy's attempt to get support for UK mini manufacturers, as the council urged earlier this year (CW, May 19). However, the government explicitly ignores this advice by stating that there will be open tendering on government contracts below the ICL 2960 level.

In view of the overall aim of the manpower sub-committee to increase investment in the development of British software skills, these latest proposals could have the effect of limiting the development of British software talent and export potential by forcing an over-concentration on software for British machines.

It is understood that the two union representatives on the sub-committee, Tim Webb, of ASTMS, and Ian Benson, of TASS, played a leading role in the development of this proposal, but will meet considerable resistance from representatives of the computer services industry and American manufacturers on the sector working party.

The sub-committee's other proposals, which are likely to find widespread support, include a call for massive injection of government money into computer education and training both at school and at work, and for in-depth research into the effects of computing on employment.

The sub-committee will recommend more money for computer education at secondary schools, with the aim of gearing this education to producing people who could slot straight into computing jobs.

It also recommends support for in-service training to keep computer staff up-to-date with the latest technology and methods.

The growing use of word processing in the office and automation in industry has led to the sub-committee's concern with the possible effect of computing on employment. It points out

# Multics comes to Europe

MAJOR enhancements and price cuts have been announced by Honeywell on the large-scale Level 68 Multics system, which is to be introduced in Europe next year.

The announcements constitute Honeywell's response to IBM's 3030 series. The 68/60 and 68/80 models are being replaced by a single model with four power levels, called the Level 68 Distributed Processing System, DPS. The power range is said to be from 25% above the 3031 to 25% above the 3033.

The basic system with 512K words costs \$1,259,000, about 50% less than the previous base price for Level 68. All software apart from the operating system is now priced separately.

New features include the ability to share resources between Level 68 and foreign hosts, an electronic mail facility for both single and bulk mail, comprehensive word-processing facilities and support for HDLC and X.25 communications protocols.

The IDS 2 database system, also available on Level 68, is offered, together with a relational database system.

The announcement marks the emergence of Multics into the mainstream of the computer market. Its importance is enhanced by the troubles Honeywell has encountered on the large-scale 68/85 system which is being extensively redesigned and will not be available until 1979 (CW, November 3).

Multics was originally designed at the Massachusetts Institute of Technology as an ultra secure system with exceptional uptime (CW, August 28, 1976).

A hardware enhancement which increases the power of the 68/80 by 15% has also been announced. As a field-upgrade it costs \$150,000 and will be available in 15 months time. New systems with the enhancement will be available in a year's time at the same price as the existing 68/80.

# Best slogan

WINNER of the Computer Weekly badge slogan competition at Compec was Marcella Davies, a lecturer in computer studies at the South West London College. Her entry was: BINARY DOESN'T HURT A BIT she wins the prize of a bottle of Champagne.

# Turn to Page 11

### Marcol 1900 Optimisation

Can enhance through put and extend the life of your machine

For further details ring M. Doran, Marcol Software Division on 402 9355 or write to him at The Marcol Group, 60 Queen's Gardens, London, W.2

# COMPUTER WEEKLY'S INSIDE NEWS

ONLINE REVOLUTION	2
MOVING UP	2
ALSO...	2
Computer interview — on software conversion	2
Focus on exhibitions	2
Deadline for disabled	3
Downside	4
Gamma expands into Europe	4
McNiff's Private View	4
Puzzler	6
Software File	6/7
People in the news	10
New Molecular system	12
Letters to the editor	12
Op Spot on job control	12
Micro news	14
Online systems	15/16
Parliamentary report	16



## COMPUTERVIEW

## Software conversion is a costly business

SINCE ICL announced its DME operating systems on the 2860 earlier this year, its 2900 orders have doubled. And the success of DME is not that it is a 2900 operating system, but that it makes the 2900 look like an ICL 1900 or System 4.

At Vickers for example (see page 3), a 2900 is replacing a 1903T. But although the 2900 was commissioned last week, it will be at least two years before it runs fully in genuine 'native' 2900 mode. In the meantime it will be running under George 3 DME, giving about a 35% throughput compared to the 1903T and operating like a 1900 George 3 system.

It took ICL a long time on the 2900 to realise two obvious facts of user life: that the cost of conversion is of major significance in choosing new systems, and that a major way of keeping an existing customer base is to provide better conversion aids to new systems than the competition.

DME was announced earlier this year (CW, April 21), over 2½ years after the 2900 was announced.

Before DME, ICL offered — as it still does — microprogrammed emulation packages running under the 2900 VME operating systems.

But these do not really provide the efficiency needed by users — such as Vickers, which requires increased capabilities and reliable live running during the transition from one system to another.

DME was not part of ICL's original 2900 plans, but was developed following strong pressure from existing users and, therefore, from the ICL sales force.

As Fred Lamond pointed out last week in Computer Weekly, ICL has now learnt its lesson, with DME playing a crucial role in the 2850 "swing" computer, which swings into the gap between the 24-bit 2803 and small 1900 systems and the 32-bit larger 2800 machines, giving a smooth transition before swinging into native 2900 mode. The danger of the DME approach, as one wit has succinctly put it, is that emulation is like masturbation — once you get

used to it you begin to think it is the real thing.

The importance of software conversion costs was highlighted recently by a report which calculated that the American government spends over \$450 million a year on software conversion — and that at least a quarter of that could be saved by more efficient software conversion practices (CW, November 10).

The report was produced by the General Accounting Office, GAO, which is the US federal government's auditing bureau.

One of the GAO's conclusions was that the government should establish a federal software conversion centre which would recognise that software conversion is an expertise in its own right, requiring skilled and experienced personnel for systems evaluation and conversion implementation.

The GAO has followed up this report with some recommendations on how to ease the transition from one type of hardware to another.

Advice includes looking through software and data to decide whether any of it can be thrown away; whether re-writing some programs is better than trying to convert them; whether there are any suitable outside contractors who could implement at least part of the project — and other common-sense advice which so often characterises any general guidelines but which is so often ignored in practice.

In the helter skelter of technological progress, it is often forgotten that the real user model evolves at a more conservative and leisurely pace.

Gene Amdahl once described his belief that IBM would never provide any radically new system that was incompatible with

existing systems by saying "Users want to reach Nirvana through the gradual evolutionary methods of the Buddhists and not through the painful Christian way of having to die before entering heaven."

This evolutionary approach should not be top of the priority list in the design of any new system because user investment in software systems is now so enormous that any other approach is bound to fail.

It is likely, for example, that the new IBM E-series, which eventually will replace the 370

range, will emerge slowly, over a period of time, and will consist of a range of processor and controller options, with associated software and networking capabilities, rather than be announced suddenly as "a new range."

In the ever-changing, microprocessing, distributed intelligence, superslick-selling seventies, it is comforting to know that the stabilising sensibility of the user exists to bring computer manufacturers down to earth.

## FOCUS

on the exhibition survival kit

ANY dedicated DP manager who completed the course in the recent Datafair, International Business Show and Compec computing exhibition stakes, deserves a merit award.

Meanwhile, evidence of attendance at each exhibition will have to be supplied; sore feet plus a glazed look will not be sufficient.

Perhaps a fully comprehensive collection of plastic bags and badges complete with computer slogans, plus a substantial collection of authenticated documentation, preferably "bundled," would be accepted as valid proof of attendance. Successful contenders would be those who express a determination not to tackle the full course the next time round.

Just why the organisers of Datafair, IBS and Compec choose to mount their sessions in a sequentially structured mode is mystifying. There certainly seems to be scope for a future policy of distribution. But

for those intent on covering such exhibitions, Focus now presents his survival kit.

Item one would be a good map. While Compec and IBS are relatively easy to broach, Datafair presents hurdles which even the most nimble goat would hesitate to negotiate. Novices to the Hamersmith site could easily discover themselves back in central London (or Slough) rather than the Cunard Hotel, such are the hazards of the approach roads.

For those who manage to beat the system and duly arrive at Datafair, a torch is a good bet. power cuts being a traditional feature of this particular event. In fact, Datafair certainly seems to have more than its fair share of handicaps, not the least that of environment. Adapting sun-dry bedrooms into industry display areas has notable limitations. What may well seem suitable decor within the confines of a hotel bedroom where wallpaper design or wall lights are concerned, only adds to the general sense of incongruity.

It did appear that DPM's were notably few and far between and had obviously decided not to date this fair.

Similarly, DP managers appeared few and far between the rather isolated stands at the International Business Show in Birmingham. At this venue, the survival kit should include salt

centre was only just slightly out of his way home and it was good for his image just to drop in and make sure the night shift were not having any problems with the payroll suite after last month's fiasco.

Turning into the car park he looked twice at the computer room windows, blinked, and wondered if he should have had that last brandy. For there, at the far end near the paper store, was a new piece of equipment he had never seen before. It was box shaped and IBM blue.

Walking into reception he could see a flurry of activity in the computer room through the security doors which should have been closed — but were not. He made a mental note to see the operations manager about that the next morning.

Then he realised that there was in fact no new equipment. But standing at the far end of the computer room, next to a carefully stacked pile of floor tiles, was a mini car with bonnet up. Underneath could be seen one end of the night shift leader carefully wedged in the space below the raised floor.

The moral of this story is one of the most frequently ignored fundamentals of working in DP — "When it's time to go home, it's time to go."

Submitted by Ian A. Riddle of Enfield, Middlesex, who wins the weekly £5 interrupt prize.

Ten years ago...

COMPUTER WEEKLY

NOVEMBER 23, 1967

THE corporate structure of IBM acquired a new four-man management committee standing between the highest level of executive and operational executives. The committee was formed by the specialised divisions within the company, and a further towards avoiding any action, were suggested as reasons... The chairman of the committee was Dr. J. H. Hollnagel, who was then director of the first complete computer history. CII's second Type 90 computer was ordered by the Dutch Shell. The committee was formed by the specialised divisions within the company, and a further towards avoiding any action, were suggested as reasons... The chairman of the committee was Dr. J. H. Hollnagel, who was then director of the first complete computer history. CII's second Type 90 computer was ordered by the Dutch Shell. The committee was formed by the specialised divisions within the company, and a further towards avoiding any action, were suggested as reasons... The chairman of the committee was Dr. J. H. Hollnagel, who was then director of the first complete computer history. CII's second Type 90 computer was ordered by the Dutch Shell.

## Rank Xerox 'donates' salesman to disabled

THE answer to the British Computer Society disabled group's prayers for full-time help has come in the form of a Rank Xerox salesman.

It is Glyn Wild, who is being "donated" to the group by Rank Xerox for the first six months of next year as part of a social service leave scheme. Under this scheme a company frees an employee to work for a charity on full pay instead of making a cash donation. About 50 companies recognise the scheme, which was started by some big firms, including ICL, IBM and Rolls-Royce.

One of Wild's most pressing jobs will be to set up a central information base, gathering information which is at present in scattered reports, or in people's heads.

At the same time he will be trying to place programmers trained at centres for the disabled, approaching the EEC for financial support and arranging the manufacture and marketing of the Mate terminal designed by Essex University for the disabled (CW, July 21).

The development of Mate is being funded by the proceeds of this year's Computer

Weekly Charity Ball, and the terminal is expected to be ready for marketing by Christmas.

Towards the end of his six-month stint Wild will look for someone to take over the director's job, probably on the same basis.

Emphasising the value of Wild to the disabled group, the chairman, Lorraine King, said, "We have been hoping all this year to get a full-time co-ordinator. This arrangement overcomes our main problem, a shortage of cash."

## Comish to be ICL marketing director



The post of international marketing director at ICL is to be filled by Douglas Comish. The vacancy arose with the appointment of the previous director, Dr Christopher Wilson to succeed Geoffrey Cross as managing director of ICL (CW, November 17).

Doug Comish joined Leo Computers in 1956. He sprang to prominence last year when he was appointed director of small business systems with specific responsibility to integrate the international operations of Singer Business Machines into ICL (CW, March 25, 1976).

This major undertaking was successfully completed on October 1, 1976. Since then, he has been director of development programmes at ICL. The international division takes in all ICL operations outside Europe, including Australia, South Africa, the Far East, Oceania and the Americas.

## Committee to 'vet' Vickers orders

THE Vickers organisation has set up a central computer policy committee to co-ordinate the computer investment of all its operating divisions and companies. The chairman of the committee is Professor Gordon Black, director of the Manchester Regional Computing Centre, head of computational science at the University of Manchester Institute of Science and Technology, and a director of ICL.

The Vickers organisation includes the engineering group, which has a nationwide network based on ICL systems, and Roneo Vickers, which has an IBM 370/138 at Romford, Essex. Last week, the engineering group commissioned a 2960 to take over from a 1903T at its Newcastle computing centre.

Assistant managing director of Vickers Jim Hendon, who is also a non-executive director of ICL, said in Newcastle last week that no mainframe or other major computer equipment or service within Vickers can now be ordered without being vetted by the committee. The aim of the committee, he said, was to optimise the use of computer resources across the organisation but that it was not seeking to impose a standard solution in all operations.

The engineering group's £750,000 2960 was one of the first to be ordered from ICL and is currently running a pre-release version of George 3 DME, which emulates the 1900 George 3 operating environment on a 2960.

## Harris joins Marcol group

THE Marcol group has been strengthened by the appointment of John Harris, manager of ICL's education region, as a director. Harris will be responsible for Marcol's growing business with hotel systems and for contract operating and software business.

Harris has been with ICL for 12 years.

Marcol expects a turnover of £2.25 million this year, compared with £1.5 million for the previous 18-month period. On January 1 it officially takes over J. Harwell Data Processing, the London company which specialises in ICL systems. Harwell will run as a subsidiary company, headed by its current managing director Jack Harwell.

## Keeping tracks on RAC rally

AS the surviving competitors in the Lombard-RAC Round Britain Rally motor into York this evening (Thursday), at the end of a 19,000 mile trip which started at Wembley last Sunday morning, a specially installed NR 8250 will be compiling the final results, which should be completed by about 20.00.

This is the first time a computer has been used exclusively to enable rally-watchers to keep

track of progress as the cars rumbled through Wales, Scotland, the Lakes and North Yorkshire. Up-to-the-minute details have been displayed on VDUs at York, and printed out on terminals at the four major service areas along the route.

Software was written by Harland Data Systems of Hull, and was based on programs the company had produced for the Mintex Rally, in February.

## Access control conference

THE automatic signature verification system, Verisign, developed by the National Physical Laboratory (CW, December 18, 1975), is one of the new subjects to be discussed at a one-day conference on automatic access control systems at the Royal Institution in London on November 29.

The conference is being organised jointly by the Institute of Electrical Engineers and the Institute of Electrical and Radio Engineers, but is open to non-members of these bodies. In-

cluding data processing managers interested in controlling access to computer rooms or access to computer files.

One of the speakers will be from the Home Office and will describe access control techniques involving fingerprints, while EMI and Cambridge Consultants will talk about 'bank credit' cards. A user's view of access control will be presented by a speaker from the UK Atomic Energy Authority. The conference fee is £17.25p, including lunch.

## Prophet likely to profit from the US

A FINANCIAL modelling package, developed in Ireland could find its way into the lucrative US market early next year. Known as Prophet, the package incorporates aids to model building which are also useful in a far wider program development context.

Prophet, already released in the UK, was developed by the Irish Nitrogen Company, NET, of Arklow, which manufactures fertilisers. To market the software an ad hoc company known as Sigma has been formed by Denis Fitzgibbon, managing director of Gamma Data Systems, a Dublin-based bureau.

There is no direct connection between Gamma Data Systems and Sigma, but the bureau is offering the Prophet package, which is also run on Gamma bureaux in London and Nottingham. Like Gamma Data Systems, these are partly owned by consultancy Gamma Associates.

Apart from NET, there is one other in-house Prophet user, the Irish Management Institute, in Dublin. Users of the package on the bureaux number "four or five."

Prophet runs on Digital Equipment PDP-11s. Financial models are developed in a very high-level language and pre-compiled into Basic Plus. To allow amendment of the Basic program and speed its running, an editor and optimiser are included. These can be used on any text and any Basic program respectively, and are already arousing general interest, says Fitzgibbon.

The size of the potential US market for Prophet was seen at first hand by Gamma Associates managing director Dr George Coggan, on a recent visit to the US. Definite negotiations have not yet begun but conclusion of an agreement is expected in the first half of next year.

## Growing show

THREE times as big as the last show in Brighton, Communications 78 is scheduled for April 4-7, 1978, and will for the first time be held at the National Exhibition Centre in Birmingham. Over 200 companies and organisations have already booked 90 per cent of the stand space.

## Exciting things happen with Prime Computer

With 24 hour working and 20 tons of rock removed with every shovelful, Taylor Woodrow need their Prime computer to optimise open cast excavation — profitably. If your business has requirements as diverse as structural analysis, vehicle route planning and financial project control, Prime has a computer in its range to suit.

Prime Computer (UK) Limited, The Meriton Centre, St Peter's Street, Bedford MK40 2PN  
and The Coach House, 173 Sheep Lane, London SW14 8NA  
Telephone Bedford 0234 69121 or London 01-878 4045

## COMPUTER WEEKLY

## Think renting.

Hewlett Packard Desk-Top Computers

from HAMILTON RENTALS

Any period of hire. Delivery usually ex-stock.

LONDON  
01-739 3444  
BIRMINGHAM  
021-236 3561  
WHITBURN  
0501-43182

## BRITISH EQUIPMENT

PAPER TAPE & 80 COLUMN CARD PUNCHES & VERIFIERS  
PRINTING PUNCHES, CARD SORTERS  
INTERPRETERS

Country-wide service organisation  
Purchase, rental or leasing terms  
16a Limes Road, Croydon  
Telephone: 01-689 6537

## KNIGHT PROGRAMMING SUPPORT

THE ORIGINAL KNIGHT CONTRACT PROGRAMMING TEAM

Successful Software Support Specialists since 1970 in the UK and abroad

27 NOEL STREET, LONDON, W.1 - 01-437 2154

## FREE CASH FOR XMAS

WE HAVE A BUDGET OF £50,000 TO SPEND ON COMPUTER SCRAP BETWEEN NOW AND XMAS. HOW MUCH OF IT DO YOU WANT? WE STILL HAVE A FEW HUNDRED BOTTLES OF SCOTCH, VODKA, ETC. SHOULD YOU PREFER EXCHANGING YOUR SCRAP PRINT-OUT ON PUNCHCARDS FOR DRINK INSTEAD. PHONE NOW 01-880 1000.

DATA-WASTE LTD.  
98 Wakeman Road, London, N.W.10.

RAIR TERMINALS  
DEC TERMINALS  
AT NEW LOW PRICES

Delivery ex-stock  
Purchase, Leasing and Rental

32 NEAL STREET LONDON WCBH 051 21 01





## Multilateral thinkers

THOSE disposed to dismiss as a paper tiger the threat of the Japanese computer industry to the world hegemony of the US companies, particularly IBM, may be disposed to think again when they consider what is going on at Japan's leading mainframe manufacturer, Fujitsu.

According to the Japan Economic Journal, the Mecca for all budding Japanese systems engineer is Fujitsu's "Information Disposal System Laboratory" in Kamata, Tokyo. Although the title makes it sound like a glorified municipal tip, the description of what goes on inside dispels any such misapprehensions.

"The atmosphere of this laboratory is completely different from that of any other ordinary office or manufacturing plant," writes the Journal.

"Men are almost perpetually busy with their special

ally busy with their special rulers, formulating various programs by writing down cryptic circles, angles and lozenges. Then there are mountains of input cards. The workers' brains are thus worked to their very limit and their ways of thinking are never allowed to roam in single directions.

"The workers have to think not only vertically and horizontally, but also diagonally and even reversely. For such mental legerdemain, extremely tough nerves and devotion are mandatory."

One can well believe it. Our friendly neighbourhood IBMer is a pretty odd sort of chap, but he's not that odd. The question raised is whether IBM can compete in the long term with such single-minded devotion to duty. Today, motorcycles and family cars. Tomorrow, the world, Rex?

## Backgambling?

FOR the second time in four weeks, Adnan Jazrawi from Reading, chief programmer with ICL Datasilk, has won the monthly backgammon tournament organised by the Thames Valley Backgammon Club.

In the consolation event, a systems analyst with Marconi Space and Research Division, Michael Moore from Camberley was the winner over Sonja Ach, whose husband Jacques is also in the computer business.

In an interview after the competition Moore was asked why so many computer people play backgammon, and he said that the game is

basically played by two types of people — gamblers and logical thinkers.

The secretary of the club, Tony Hood, who is not a computer person, wonders which of the two groups are predominant in the computer industry, and asks, "Are our computers designed and operated by gamblers who think logically, or by logical thinkers with a gambling instinct?"

Either way, Thames Valley Backgammon Club welcomes all players. Details of membership can be obtained from the secretary, Tony Hood, at 10 Monck Court, Southcote Road, Reading, Berks. Telephone Reading 585410.

## Ghost in the machine

AN interesting postscript to the recent Futureview interview with Arthur C. Clarke (November 10):

Webster: There's one area in computers that is growing quickly, and that is computer crime.

Clarke: Yes, it's a growth industry.

Webster: It has a whole terminology of its own:

## The sticking point...

THE news that the Tesco supermarket chain is to spend £6 million with IBM for this week's special computer offer, a 3031, a 3032, and other assorted commodities (CW, November 17) has prompted me into considering the obvious — whether Tesco will attempt to pay in unused Green Shield stamps.

If they do, just what can IBM expect to get through its corporate letter box? In-

trigued by this question, I took my 5 Mbyte Abacus in hand and set to work. The result is, to say the least, a large number.

IBM may just be on the receiving end of 18,181,818 Green Shield stamps. If Tesco are kind, and have long tongues, this could be reduced to 14 Megabooks. There is one problem: 3031s and 3032s aren't in my Green Shield catalogue.

## Pansophistry

PROOF that not all the visitors to Compex were data processing geniuses (genii?) was provided by some of the entries to a competition run at the show by software house, Pansophic. Visitors had to guess how many source statements there are

in Pansophic's program management package, Panvalet. The actual number is 332,189 and the prize-winning guess was 337,852, not too far off the mark, which is more than can be said for some of the other guesses, which ranged from a mere 64 to 80 million.

## IBM releases third Series 1 operating system

RELEASING its third Series 1 operating system in the US, IBM has given users a couple of surprises. The software has been released a month earlier than expected, due to early completion of testing, and it will control user programs in the maximum 128 Kbytes of memory.

The previous operating systems for the machine, CPS and RPS, only supported programs

in 64 Kbytes. The third product known as the event-driven executive, was expected to have the same limitation.

As the name implies, EDX is designed chiefly to handle programs dependent on external events, for example data acquisition and process control. In this role, the Series 1 seems likely to take over some of the applications previously managed by IBM's System 7. The

availability of such software also emphasises the distributed processing orientation of the Series 1.

The larger memory capacity will, however, make the EDX system attractive to a wider range of users than the specialists, since large and more complex user programs and systems can now be accommodated. EDX provides a multiprogramming and multitasking environment, and includes software for dataset management, distributed processing, and communication with a host program entry, editing and interactive debugging, sensor handling and graphics display. Terminals supported include 4878 VDU and any ASCII terminal connected through a teletype adaptor.

EDX has not yet been announced in the UK.

## Gray quits presidency

REFLECTING the metamorphosis of Cray Research Inc from a development into a production and marketing company, founder and chief executive Seymour Gray has been appointed chairman. Gray hands over the post of president to John Rollwagen, previously vice-president for marketing and finance.

Rollwagen will be responsible for day-to-day operations and marketing, freeing Gray to concentrate on technical leadership for research and development.

The company builds large-scale vector processors designed for fast execution of complex scientific and technological tasks. They need to be front-ended by a large general-purpose mainframe in most applications.



Dr George Coggan

## Gamma to expand in Europe and US

AFTER several years of rapid expansion in the UK, the Digital Equipment specialist systems house, Gamma Associates, is aiming to expand overseas with joint ventures on the Continent and in the US.

Gamma's managing director, Dr George Coggan, is currently talking to US systems houses that might benefit from an association with Gamma.

He told Computer Weekly: "We are ten times the size of the average DEC systems house in the US and have been associated with DEC five times as long. In fact, we probably have the largest body of DEC software expertise outside DEC itself anywhere."

In addition, few US organisations have our experience in running a PDP-11 based sharing service."

Gamma is already closely involved with a US software house, AW Consultants in Philadelphia, in a joint enterprise called Gamma Telecommunications (GWT), May 31, sells systems that run AW special multi-terminal network software to retail organisations in the UK.

The Continental market being looked at most closely by Gamma are Benelux and Scandinavia where the firm believes that the much lower cost of software development in these areas will enable it to supply services at 70 per cent of the price charged by local specialists.

Gamma Associates formed a company, Gamma European Systems, specifically to set up joint venture firms on the Continent. Gamma Associates is aiming for over £2.5 million in revenue financial year.

## CW/DPMA workshop next week

Date: December 1.

Venue: Holiday Inn, George Street, London W1.

Price: £45 plus VAT (£40 plus VAT for DPMA members) including lunch and refreshments.

I wish to order... ticket(s) at £45 plus VAT (at 8%) for the CW/DPMA workshop to be held at the Holiday Inn on December 1.

DPMA members can apply for reduced rate tickets via the form that is being sent to all DPMA members.

Cheques should be made payable to IPC Business and Industrial Training Ltd.

Name .....

Job function .....

Address .....

Telephone number .....

If you are interested in attending any future workshop because the December 1 meeting is full or is inconvenient, tick here ☐

Return this coupon to Computer Weekly/DPMA Workshop, IPC Business and Industrial Training, Throwley Way, Sutton, Surrey SM1 4QQ.

COMPUTER WEEKLY in conjunction with the Data Processing Management Association is organising a workshop on December 1 aimed at improving the skills of DP management in communicating with end users.

The workshop will be given by Nigel Laurie, who has more than 10 years' experience in the communications and computer fields.

Numbers are limited to ensure that all delegates are able to participate fully in the day's work, but if there is sufficient demand, further workshops will be held.

In order to ensure that the workshop is tailored to DP management's needs, the DPMA is currently conducting a survey of its members on DP/user communications. Survey forms can be obtained from the DPMA, 27a York Road, Maldenhead, Berkshire SL8 1SQ. Tel: 0628 28979.

If you would like to attend the workshop, please complete the coupon above.

## Polytechnic Systime

THE computer system installed at City of London Polytechnic, and referred to by Derek Esterson in his article on computers in schools (CW, November 17), is a Systime 5000 based on a Digital Equipment PDP-11.

## ACOUSTIC COUPLERS

Contact: MOORE REED & CO. LTD. Welwyn, Andover, Hants. Tel: Andover 4155

## The alternative to IBM

Disk drives, tape units, memories, terminals, printers, Telex Computer Products UK Ltd, 213 Oxford St, London, W1, 01-784-0181

TELEX

# ANNOUNCING U.K. POST OFFICE APPROVAL FOR gandalf LDM 404 AND PACK SYSTEM

"PRODUCTS FOR THE DIGITAL AGE"

- ★ Low cost only £800
- ★ Full complement of signal status indicators
- ★ Remote and Local Loopback
- ★ Constant, Controlled and Simulated Controlled Carrier operation
- ★ Simple Installation
- ★ Interface meets EIA RS 232 C and CCITT V.24 requirements
- ★ Dual Channel option enables two 2400 bps channels to be carried simultaneously
- ★ RM 3404 B rack mounted equivalent fits Gandalf 3000 Cabinet
- ★ SELF CHECKING is fast and easy using the Local and Remote Digital Loopback and Local Analog Loopback capability



The LDM 404B is a Limited Distance Modem designed for full duplex synchronous communication at 4800 bps. The unit operates over 4-wire voice grid metallic lines (conditioned or unconditioned), T Carrier and most other carrier systems. It is ideal for use in metropolitan areas for "mid-range" applications where short haul units are not satisfactory but distances do not warrant the cost and complexity of long haul modems.

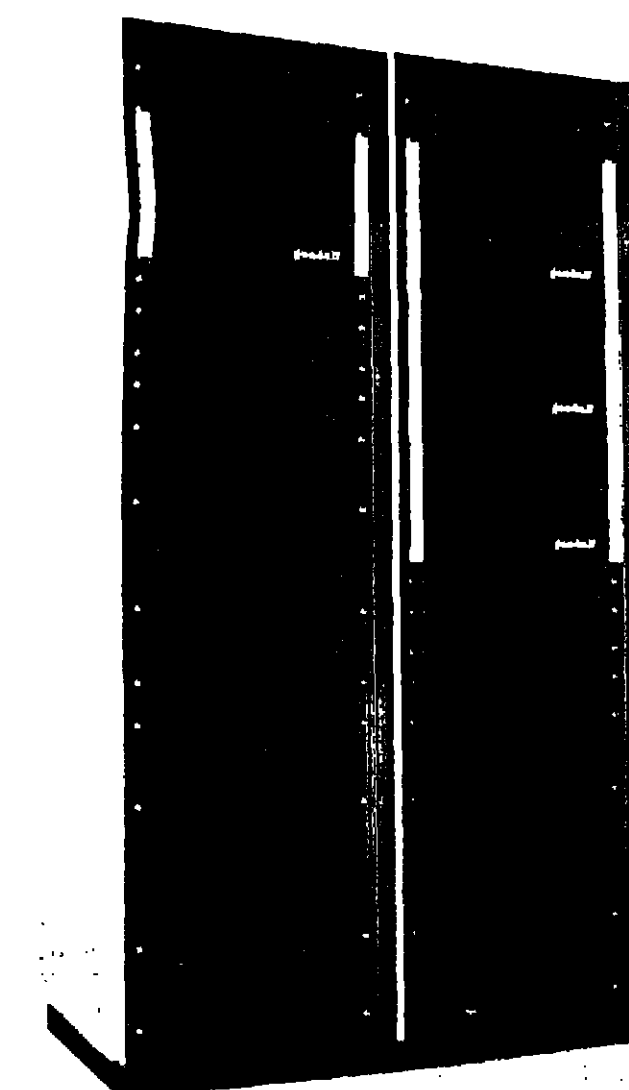
★ ★ ★ ★ ★

- ★ Post Office Approved
- ★ Resultant savings outweigh costs in less than one year
- ★ Will allow contention of up to 254 terminals for up to 126 computer ports classified by service, speed, etc.
- ★ High speed synchronous and asynchronous operation
- ★ Easily expanded from minimum size in increments of 4 terminals and 8 ports

For further details contact:

MASTER SYSTEMS LTD  
(Data Products)

306 Yorktown Road  
Camberley, Surrey  
Tel. (0276) 32903  
Telex 858180



## KEYBOARD CLASS SELECT

Keyboard Class Select enables terminal users to request a specific service class using only the terminal keyboard, without additional hardware. Since all communications remain at the "normal" terminal speed, existing communications links need not be altered. PACX III can operate over specialised digital networks, the dial-up system or multiplexers.

## STATISTICS PORT

A special Statistics Port is provided which may be connected to the CPU or other data handling device. The port outputs a complete record of all connections, disconnections and unsuccessful requests, accompanied by time of day. Commands are accepted to perform control functions such as changing port classes or forcing connections.

Depot 134



## MICHIE'S PRIVATEVIEW

## Aha!—that flash of insight



IN the October issue of Scientific American Martin Gardner discusses the latest version of Robert Abbott's game of Eleusis. At the University of Colorado, Abbott, as a psychology student, became interested in the "aha" reaction—that flash of insight in which we grasp the underlying principle behind some messy-looking phenomenon.

In Eleusis the dealer has a secret rule in his head which governs what cards may and may not legally be laid face up in sequence.

The players take it in turns to add to the lengthening sequence in an attempt to work out by trial-and-error guesswork, i.e. by "inductive reasoning", what this secret rule is. Whenever they add cards which fail to fit, they collect penalties. Of the process of induction Gardner rightly remarks that it is "the process at the very heart of the scientific method."

Special interest should, therefore, attach to computer implementations of induction. Software systems are certainly needed to do more than donkey-work for the mathematician and scientist. Here, I note two recent laboratory advances in this area, one mathematical and the other in applied science.

The natural numbers, with the rules of arithmetic, constitute established territory for mathematical discovery, which in aggregate makes up modern number theory. There are tantalising problems which can be very simply stated. Probably the most celebrated is Fermat's conjecture that expressions of the form  $x^n + y^n = z^n$  are not satisfiable for  $n$  greater than 2. Trial and error and inductive reasoning certainly play their part when mathematicians arrive at in-

teresting conjectures. Could a computer program, set loose in this problem space, wander around looking for good conjectures?

One reaction is "If all it is going to give us are things like Fermat's conjecture, then why bother?" After the spectacular application of prime factor theory to computer privacy, see D. W. Davies' articles (CW, September 15 and 22), I hope that computer people of all people will not sell number theory so short!

Doug Lenat, working on Stanford's Heuristic Programming Project, developed a program which wanders around guessing in much the style alluded to above. Starting from bar-essentials it rediscovered Euclid's "unique factorisation" theorem which states that a composite number can be factored into primes in only one way.

This theorem is basic to the above mentioned encryption procedure.

Lenat's program, which has the curious name AM, first had to discover the concept of a prime number, and before that the concept of a number. It started life with a collection of concepts no richer than those of a child of four—objects like sets, lists, bags (sets allowing replication of elements) and truth-values; relations like membership and equality; operations like inversion, composition and intersection.

It would be a mistake to shrug off this experimental program on the grounds that it has not yet discovered anything which mathematicians did not already know about. One of its discoveries, "maximally divisible numbers," was at first believed by Lenat to be new, and by a number of mathematicians to whom he showed it. Later it

turned out that Ramanujan, G. H. Hardy's self-taught collaborator, had got there first.

If from such modest starting materials AM can raise itself to these levels, what may not be achieved by an improved version working on an enriched stock of starting concepts?

If machine induction merely brightens the lives of pure mathematicians, the workaday world will be respectful, but unimpressed. Let us turn to a specialism which is more earthy, in more than one sense.

In the rich agricultural state of Illinois, where the soy-bean cultivator's crop has been smitten with one of the 20 or so common soy-bean diseases, correct diagnosis may make the difference between a ruinous harvest and riches. The State operates a network of Agricultural Extension Offices which farmers can phone for advice. Queries which cannot be dealt with on the spot are sent to university plant pathologists, who are greatly overburdened with requests. Large delays and backlogs develop.

An inductive inference program, AQ11, has been developed at Illinois University by Ryszard Michalski and students. It is quite general, and could just as well be given Eleusis problems. What it was actually given was data on 307 diseased plants as a list of measurements on 35 different features for each plant, together with a confirmed diagnosis.

From this the program developed its own diagnostic rules which were tested on 376 new cases, getting 374 of them right. Dr B. Jacobsen, the plant pathologist who collaborated on this work, developed his own set of rules, which scored only 83 per cent on the test sample. In attempts to improve them, the rate rose to 83 per cent. Jacobsen's verdict on the machine-generated rules, after investigation and reflection, was full acceptance.

The planned next step is to equip Extension Offices with terminals online to the new rule-based system, so that staff can get the farmers quicker, and it seems more accurate, answers.

Computing systems have heretofore been used only for deductive-type operations. But new additions to the information engineer's tool-chest may be on the way.

Donald Michie

## Puzzler

A SQUARE-BASED pyramid has eight edges and five vertices. This week's puzzle is to give each edge a different number, from 1 to 10, in such a way that "the sum of the edges meeting at each vertex" is 16 in all cases.

The big problem is to decide which eight of the available ten numbers must be used. See page 47 for the solution, which is unique apart from rotations and reflections.

## SOFTWARE FILE

## Business Basic 'first' on micro

THE range of applications software produced by consultancy KPG on its Solitaire system (CW, August 4) conceals an interesting systems software product—what is claimed to be the first business-oriented Basic on a microprocessor.

All the commercial packages on the Intel 8080-based Solitaire are written in this extended form of Basic and the machine has a resident interpreter.

KPG is, at present, releasing the Business Basic interpreter only to run the packages. A release for customers to write their own programs is a technical feasibility, but KPG does not have the resources to support such users fully, a spokesman admitted. A future release of this nature was not discounted.

Business Basic adds several commercially useful functions to standard Basic, particularly in the areas of string handling, screen and print formatting and management of indexed sequential files.

Solitaire in its present configuration is based on a three-processor 8080, CPU functions, I/O and visual display management each being handled by a separate machine. The Basic interpreter can, however, run on other 8080s and is quite easily

convertible to other makes of micro, said KPG.

In the debate between compiler and interpreter philosophies for micros, KPG has come out wholeheartedly in favour of interpreters, largely because they allow immediate testing of code during program development. Some companies, favouring faster run-time, have plumped for a compiler approach.

KPG's current applications software for the Solitaire includes word processing, sales, purchase and nominal ledger, time analysis accounting systems for

solicitors and accountants, payroll and estate management.

Many of these packages were implemented initially on the Basic Four minicomputer, clients. Development of the Solitaire interpreter allows simple conversion.

Besides satisfying the requirements of purely commercial installations, availability of word processing and commercial software could encourage users to put both types of applications on the same machine, rather than implementing a dedicated word processing system.

The project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

ANOTHER package has been released to aid company administrators to cope with increasing government legislation, this time in the pensions area. The Passman software, from financial software consultants Heywood and Partners of Liverpool, is particularly concerned to handle the requirements of the 1975 Act of Parliament on this subject.

Passman is a parameter driven sys-

## Parameter driven pensions scheme

tem which maintains files of all a company's pensionable employees, continually updating the records with all entered pension transactions. Required government forms are generated as well as user-defined in-

ternal reports, auditors' information and periodic—usually annual—pension statements.

The package is written in Cobol and avoids machine-specific subroutines as much as possible, said a spokesman.

Hence it should be easily portable. At present, versions exist for IBM 380/370 and ICL 1900 and 2803/4 machines, but one of the first prospective users requires a conversion to Univac equipment.

Non-standard modules can be added to the Passman system to manage accounting of pensions contributions and payroll for employees and dependants entitled to a pension.

There are already about 10 "highly probable" prospective users of the package, said Heywood. Passman can be used on an in-house machine, or Heywood's ICL 2804 bureau.

## CMG 'first' with overseas system done in UK

WITH the problems of UK software development work for overseas clients receiving much attention in recent months (CW, June 9 and November 10), the Computer Management Group has completed its first development of this type, for an unnamed multinational manufacturing company's Helsinki, Finland, office.

The project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

project, worth £25,000 to CMG, involved the design and implementation of an accounting and manufacturing control system for the IBM System 32.

The software includes sales, purchase and nominal ledger, stock control, monitoring of work in progress, cost accounting and collection of statistics.

CMG has done work for many overseas clients before, but the

## CGS plans move into US market

A MOVE into the US market is likely for the European CAP Gemini-Sogefi consultancy group next year. No firm arrangements have been concluded yet, chairman Philippe Dreyfus told Computer Weekly. But CGS is definitely investigating the possibility of founding a US office.

At the same time, M Dreyfus confirmed that between 10 and 15 per cent of the group's shares have come on to the market. These shares belonged to two former directors who left the group two years ago. Contrary to US reports, the group is not looking for a US company to acquire the shares. "They may be taken by my company, US, European or British," said Dreyfus.

## Dynamic OS

THE latest operating system for Interdata, Dynamic OS/32 MT, and its associated Multi-Terminal Monitor (CW, October 27) have been expected, been officially released in the UK. The operating system is priced at £3,350 and MTM at £1,680.

## PROGRAMMER NOTES

## Ode to the joys of freelancing

MANY of our past discussions on the programmer's life have made the tacit assumption that most of our readers are permanently attached to one particular company.

With the increasing prominence of the freelance programmer, this view, and its attendant discussions of such topics as "your installation's programming standards", are perhaps becoming less and less consistent with the real state of the modern programming world.

Perhaps it is time we gave the freelance programmers a platform to discuss their view of the joys and problems of programming.

To consider the above question first: most installations nowadays have, for good or ill, their own program development techniques and standards, ranging from comprehensive strategies like the Jackson technique to simple data naming conventions.

It would be interesting to see whether freelance programmers fit in easily with these established environments, or whether it is a source of conflict.

Does the installation try to impose its standards on you, and do you, in consequence, have to be flexible? Or do most installations allow a freelance to program in his or her own style, risking possible conflict with the permanent programmers?

The problems of selection of appropriate programming techniques and standards in the freelance business are, of course, not new. The employer knows that

a freelance proves inadequate to the job, he or she can be dismissed with less difficulty than a regular employee.

On the other hand, the employer is more willing to train an inexperienced permanent employee than an inexperienced freelance.

Most freelancers have had experience of permanent programming posts. Do you find employers more assiduous in assessing your expertise when being interviewed for a permanent position or for a freelance job?

The increasing proportion of freelancers and prospective freelancers was graphically illustrated last week at a meeting of the Association of Independent Computer Specialists. More than 120 people turned up to hear about the advantages and disadvantages of freelancing.

What is the reason for this trend? Are permanent programmers simply bored with government-imposed limits on pay rises and see this as a way of getting a sudden jump in salary; or are there other attractions?

Do you get a more interesting variety of work as a freelance, or do you become known as an expert in a certain field and get recruited to an endless stream of identical programming tasks?

There must be a number of interesting technical and personal consequences of transitioning from a regular to a freelance life. Programmer Notes hopes that the freelancers among our readers will come forward with some happy and

tion and interface with other IBM software, particularly Vsam and Vium.

There are also disturbing reports from the US of VSPC abuses bringing down the whole system, or necessitating a deliberate halt to processing.

Such troubles have led at least to two US users, the Centre for Disease Control in Atlanta, Georgia, and Portland General Electric, Oregon, to consider discontinuing VSPC use. The latter installation reported that it used to have daily VSPC failures.

IBM's announcement of the product was unusually low-key, leading to suspicions that it had been released before it was really ready (CW, December 18, 1975). Users accepted, at the time, that there would probably be some "teething troubles".

The shortcomings, however, appear to have persisted, in two vital areas—resource consumption and interface with other IBM software, particularly Vsam and Vium.

The Centre for Disease Control reported that VSPC was tying up machine resources to the detriment of other users. The only way to remedy this was to cancel VSPC. This resulted in the loss of related data, such as APL worksheets, although this was not supposed to happen.

One UK user supported this criticism. The installation, said a spokesman, could live with the increased resource consumption of VSPC if it could control the priority of the system at times when non-VSPC work was more important.

Generally, however, UK users' troubles have not been so severe as those in the US, though the

Vsam and Vsam interface problems seem to apply equally to both countries.

Assessment of IBM's support efficiency varies. One user said that the company had been "very good" at responding to problems, but another thought that the IBM in the UK was comparatively short on VSPC expertise, due to the smaller user community.

## PL/I versus Algol 68 debate

FEW software topics arouse more energetic dispute than the advocacy of one programming language over another. The audience at a debate sponsored by the BCS PL/I specialist group, on December 1, is thus assured of an interesting evening.

The motion for debate will be "Anything PL/I can do, Algol 68 can do better". Prominent advocates of the two languages are expected to speak, though the final line-up has not yet been decided.

Venue is the engineering lecture theatre (Room 508) at University College, Gower Street, London, WC1. Admission is £1, and free Rail Ale will be available.

## Communication that's kind to your pocket



**Teletype 83**  
The Teletype 83 is a true, versatile, economical, reliable. What other features does it have? The Teletype 83 is standard.  
For example:  
128 characters line  
Upper/lower case  
100 CPS printer—variable individual digits  
Switch under/over/with  
True 30 CPS buffer  
Word/line/space/sentinel, there's a test for that there's all the printed functions.  
All these features are Teletype 83's standard features. For more information, see page 47.  
Find out more about the Teletype 83 here.  
Teletype Equipment Division of GADC Ltd  
Trump House, 100, Victoria Road, London W14 8JH

## TECHNICAL SOFTWARE SERVICE FOR MINI'S AND MICRO'S

Micro Consultants offer a technical software engineering service which covers:

- automatic test systems
- large industrial data acquisition systems
- ultra high speed data collection
- high speed BASIC-like interactive systems
- specialised FORTRAN or CORAL libraries
- video control and image analysis

The Software Service operates as part of an integrated engineering organization. Micro Consultants are, therefore, equally able to design and supply:

- micro-processor hardware integrated into a customer's equipment
- specialised arithmetic units
- interface units

All fully supported by software - AND BY ENGINEERS WHO UNDERSTAND BOTH HARDWARE AND SOFTWARE.



**Micro Consultants Ltd**  
INTERFACE HOUSE, CROYDON ROAD, CATERHAM, SURREY, CR3 6DD, ENGLAND  
Telephone: CATERHAM 48921 (7 lines)

## Computer Marketing

Working with and supported by British manufacturers.

Newbury Labs low cost British made VDU. 7001/2 teletype replacement. 7004/5 sophisticated VDU with block mode trans. Full cursor control, data protect and highlighting. Delivery now from 6/8 weeks.	Prices from	£575
MSI low cost British made range of cassette data recorders. Teletype compatible. High speed (2400 B.P.S.) Standard serial interfaces. Remote operation.	Prices from	£432
Midicron 22 low cost British made Paper Tape Reader. Punch. Reads to 150 C.P.S. Punches to 50 C.P.S. standard serial interfaces. 5, 6, 8 level operation.	Prices from	£932
Computer Marketing EXB10 low cost high speed electro-sensory printer. 80, 40 or 20 characters per line. Upper and lower case. Up to 160 C.P.S. standard serial interfaces.	Prices from	£699
Digital LA36 Delineator 30 C.P.S. KSR printer, teletype, Ex. Stock.	Prices from	£965
New ASR LASH DEC printer teletype compatible. M22 ready punch.	Prices from	£1886
Digital LSI 11 processor modules, systems and peripherals. Full range available. Ex. Stock. Low cost immediate delivery. No money advance at all and easy split pay.		

**Computer Marketing**  
641 London Road, West Thurrock, Essex.  
Tel: (04026) 3010 Telex: 896786



Contact  
**Stuart Moore**

### YOU NEED THE BEST SO FORGET THE REST

Contact Sarah Smith on 01-283 3237 for  
\* Top-quality contract programming staff always available  
\* Rates from £150 to £220 per week  
\* References checked and work guaranteed  
\* Permanent staff also available  
\* MARTON ASSOCIATES 208-210 Bishopsgate, EC2  
FOR COMPUTER PEOPLE AT THE CROSSROADS

**CDL for IBM**

**DATA PREPARATION EQUIPMENT.**  
Brokers service for used Computer and Peripheral Hardware  
**FOR ADVICE ON  
BUYING-SELLING OR MAINTENANCE**  
Call 02774 58028/9  
Commercial Data Ltd  
2 Holly Court, Billerica, Essex

**We are looking for:  
USED DISK-PACKS  
and  
DISK CARTRIDGES**  
Box 1908  
Computer Weekly

### PDP11 FOR SALE

8K with 500 cps reader 110  
cps punch twin floppies Centronics printer ASR33 also 3  
off-line teletypes for data prep.  
**LIGHTNING PRINTERS**  
01-539 2118

### FOR SALE

2 MDS 6403  
1 MDS 6401  
1 Univac Printer  
DCT2000  
**OFFERS TO:  
BRIAN PUGH**  
0223 465200  
Ext. 270  
Wheatheaf  
Computer Centre  
Charter Avenue  
Coventry

### FOR SALE

**ICL EDS 100  
DISC PACKS**  
Slightly used  
Also IBM 3330 available  
**Telephone:  
John Buckle**  
01-722 8320

### COMPUTER WEEKLY

The following special supplement is due to be  
published during

### DECEMBER DECEMBER 8 — ACCESSORIES AND ANCILLARIES

The efficient running of a computer department and the effective use of  
computer output depends to a great extent on the adequacy of the  
ancillary equipment.

Paper supplies, the security system, cleaning equipment, etc., are all  
small but vital factors in machine room housekeeping.

On December 8 Computer Weekly will be taking a look at the computer  
room's vital hinges and some of the new products available.

#### LONDON AND WESTERN

Stephen Measures 01-281 8283, Tony Kaminski 01-281 8022, Stuart  
Moore 01-281 8109, Lloyd Collins 01-281 8787.

#### MIDLAND

Ken Perrot 021-358 4838

#### NORTH AND SCOTLAND

Harry Allan 081-872 4211

Stop Press: Computer Weekly continues to publish more products and  
recruitment advertising and has a higher fully requested A.B.C. (Audit  
Bureau Circulation) of 76,081 than any other U.K. computer publication.

\* Additional 10,138 regular readers in Western Europe via the  
INTERNATIONAL EDITION which is published the 2nd week in every  
month excluding August and December.

# market

WANTED

### Contract Staff available

for Home and Overseas assignments

**01 680 2400**

Metra Lowndes-Ajax  
119 High Street, Croydon CR0 1QJ  
We are always interested in hearing from  
people who wish to work on a contract basis

Metra  
Lowndes-Ajax

m

### WANTED FOR CASH

Second-hand Teletype 33's  
Best prices paid  
Tel: 0442-82 4011  
Ext. 24

### FOR SALE

IBM 360/50 512K  
3 selector channels 50Hz.  
Available December, 1977.  
F.O.B. Germany. First firm  
offer over £44,000 secures.  
Box 1907, Computer Weekly

### PDP 11 EQUIPMENT FOR SALE

PDP 11/45 32Kb core computer with console, etc. £25,000  
128Kb parity core memory £11,000  
32Kb semi-conductor core memory £8,000  
Floating point processor £3,000  
RP04 disc drive and controller £17,000  
RP04 disc drive £15,000  
8 track TU10 tape drive and controller £7,000  
One 9 track and on 7 track TU10 tape drive £5,000 each  
Two 132 column line printers (3001pm) £5,500 each  
16 line DH11-AC Multiplexer £2,750

Equipment purchased in January 1976 and available in  
January 1978. All equipment maintained by D.E.C. and all  
prices exclude V.A.T. and are negotiable.

B. D. F. MANSFIELD  
Singer & Friedlander Limited, 20 Cannon Street, London  
EC4M 8XE  
Telephone: 01-248 9846

### CAN YOU AFFORD TO LOSE YOUR MEMORY?

One 150 kVA Transipak Uninterruptible Power Supply,  
computer grade, available for immediate delivery complete  
with battery.

Write or telephone to

CHLORIDE TRANSPAK LTD.  
Stanley Road, Bromley, Kent  
Tel: 01-480 9861

FOR LEASE OR SALE

**I.B.M.  
370/155  
WITH  
DAT BOX**

AVAILABLE  
1st QUARTER 1978

REPLIES BOX 1910, Computer Weekly

WANTED  
DEC PDP11/04  
OR 05 OR ETC.

Series upwards with minimum 28K  
Core. Minimum MAS storage required  
2.4m bytes.  
Maximum 20m bytes including sufficient  
terminal capacity.  
Write to:  
**CRISTIE ELECTRONICS LTD.**  
P.O. Box 18, Stroud, Glos.  
or TEL. 04536 77905

**tectonics**  
guarantees

**12 MONTHS  
FREE SUPPORT**

on all development  
projects, from one-  
program to major systems  
contact Terence Salmon ORP 2914  
Tectonics Ltd 54 Tintagel Rd Oystermouth  
The fixed price fixed time specialists

### DECWRITERS £995

PLUS VAT  
IMMEDIATE DELIVERY  
MAINTENANCE ALSO AVAILABLE

**PHONE: 0908 564747**

PERICOM DATA SYSTEMS LTD.  
60 BURNERS LANE, KILN FARM, MILTON KEYNES

### ONE BOTTLE OF WHISKY

from 2 boxes of Punch Cards.

Why not finance your Xmas  
Party by selling your scrap  
computer listings and punch  
cards to:  
**Leyton Waste Paper**  
Tel: MIKE BOWLES  
01-558 2131

King Lane-Heywood, Lancashire  
L20 9JF (near the old bus station)  
Queens House, Heywood Rd, Heywood, Lancs  
A Computer World Book Centre

### ICL 1903T with Communications facilities

available in January, 1978  
PHONE: 01-928 8885  
MR. R. BERRIS  
PIPER, SMITH AND BASHAM  
For further details

### PRINTER GRAPHICS

LOW COST \* FULL CAPABILITY  
CENTRONICS COMPATIBLE  
Contact: Ray Springall  
on (0800) 514182  
DATACOM SYSTEMS  
128 Bradwell Road  
Milton Keynes



For all computer  
time.

### FOR SALE

314 Sorters, 1,000 CPM  
Reproducers, Collators  
Three months' guarantee  
TEL. 01-237 2976

### FOR SALE

800-INCH WIDE  
MAGNETIC TAPES  
HONEYWELL 400  
TEL: 0908-73789

# place

**FOR SALE**  
Dataprinter

### ELECTRONIC BROKERS LTD

**THE SECOND-USER COMPUTER PEOPLE**  
STOP PRESS  
Just received/large quantity  
of top quality computer floor-  
ing. Bargain price, installation  
available.  
New Catalogue just  
out. Send for your  
copy now - POST FREE

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

IBM 360/50 512K, 3 selector channels, 50Hz, available December, 1977. F.O.B. Germany. First firm offer over £44,000 secures. Box 1907, Computer Weekly

### DEC. 11/04's & /34's

**NEW HARDWARE - WIDE RANGE OF  
PERIPHERALS - QUICK DELIVERY  
- BARGAIN PRICES - LINK OF EUROPE**

**SYSTEK LTD.** 46 Fitzroy Street  
London W1P 5HS 01-388 7828

**NELSON COMPUTER SERVICES LTD.**  
FOR SALE  
COMPUTER SYSTEMS - ICL / IBM / DEC /  
DATA-PRP EQUIPMENT - ICL / IBM /  
UNIVAC / KODAK / TELETYPE  
BURNERS / DECODERS / GUILLOTINES  
D.P. STORAGE CABINETS (inc. FIRE PROOF)  
FOR FURTHER INFORMATION CONTACT  
St. John's Court, Haverhill, Lancs BB4 7PA. Tel. Rossendale (07082) 20128.

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid

IBM 029 Punches - print and non print  
Univac up's and up's IBM 082 Series  
Mini Burners, New 4 part Decoders, 7  
part Decoders, Hand Punches, reborn  
shod, LBS & VAI and carriage  
WANTED: Teletypes and Hand Punches  
Best prices paid



## PEOPLE

## Telephones for deaf from computer centre

CHILDREN at the Royal School for the Deaf in Derby can now use the public telephone system, thanks to the staff of the Derby Post Office Computer Centre.

The Centre's Benevolent Society has donated to the school two phonetyping machines, which convert into a typed message at the receiving end. The phonetyping is a reconsonated and adapted Post Office telex machine, for which the official UK supplier is the Breakthrough Trust at Wellingborough.

Peter Thomas, former senior sales consultant with ICL, has joined the commercial systems division of Computer Automation as Southern region sales manager.

Other newcomers to the division are Ivan Tager, previously high-volume product support manager with ICL, who joins as customer support manager; David Mundy, formerly a systems analyst, who becomes systems engineer; and Cheryl Lewis, who was a project administrator with ICL, and who will run the new planning and admin department.

Deaf people can make calls to ordinary telephones through one of the five or six link-up centres throughout the country, and this is particularly important to the children at the Royal School, who come from all over the UK and who can now telephone their parents when they are at school.

The machines can also be used as an internal link between the school buildings, and will help any children to increase their language ability, said the principal.

Bill Butti, who until recently was commercial and OEM systems manager with Varian, has moved to Wang as computer products manager in the technical and commercial sales division.

Richard Forsyth, lately academic programmer at the City of London Polytechnic, has moved to Rair Timesharing as software manager. Tony Green has joined Rair Terminals as senior sales engineer for the UK and Europe. He was formerly logistics manager in Corsor's service division.



Himsley Bawa

Maurice Bean has been promoted to the newly-created post of protection systems manager for Honeywell's commercial division in Bracknell. He has held a variety of posts in marketing and distribution since joining Honeywell 36 years ago, and most recently was protection systems specialist.

Stephen Bishop, consultant with CMG, has been appointed an associate director of CMG West End.

Pat Muir of Redifon Computers has been promoted from senior systems analyst to Southern branch systems manager, based at Leighton Buzzard. Systems analyst Janet Fooks becomes systems supervisor responsible for the showroom and demonstration capability in Stratton House, London.

Janet Fooks

Muir

Keneth Walker becomes financial director of Kode. He was previously with Mono Containers as financial director.

Nettson Kite, previously publicity manager for ICL Datasolve, becomes PR manager at BOC Datasolve. Jim Hensley joins Datasolve as publications executive. He was formerly a journalist with Southern Newspapers.

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy

Ivan Tager

Bill Butti

Nettson Kite

Jim Hensley

Keneth Walker

Pat Muir

Janet Fooks

Stephen Bishop

Maurice Bean

Richard Forsyth

Cheryl Lewis

David Mundy



## LETTERS

## Power at Datafair

I SHOULD be grateful if you would correct an error of fact in the final paragraph of Focus (CW, October 20).

There were no power problems at Datafair. So smoothly did it all go that one of the IBM executives remarked to me nostalgically "It's not fair - why aren't we having any dramatic power cuts?". Shades, I understand, of 1975. But that was two years ago - perhaps your correspondent never recovered from the trauma!

P.S. Just remembered! A fuse went on the third floor due to an overload in one of the technology corridor rooms. This was attended to in the record time of four minutes flat. I know, I was there all the time, and it only affected the five rooms involved.

RUTH REES  
Conference Organiser  
Datafair  
Comment from Focus: "I was there during the four minutes blackout. Perhaps I'm getting too shocking!"

## Interrupt misses punchline

YOUR "Interrupt" contributor seems to have missed the punchline.

The point about the Titan simulator, if I remember it correctly, was that it *always* said "system full" after you typed in your password; that you would never know that you had given your password to the simulator (which could be left running at an unattended terminal) rather than to Titan itself.

This simulator would write the user identifier and password to its own file-store and the victim would never be any the wiser.

MICHAEL KAY  
Crowthorne,  
Berkshire.

inherent in the bubble memory system ensured that none of the stored information was lost, so that the demonstration was able to continue immediately mains power for the VDU was restored.

P. C. NEWMAN  
Product Manager,  
Magnetic Bubble Memories  
Plessey Memories,  
Towcester.

## No guarantees in this unpredictable world.....

IN his letter Peter Haine appears to present a very short-sighted view of the efficacy of professional standards in preventing disasters (CW, October 27). He lists several computer applications which have in common the factor that human life or something else of vital importance can depend on the satisfactory performance of a computer system, and he goes on to suggest that such standards provide a guarantee of this performance and a means of redress should it be lacking.

Surely he cannot be unaware that in this unpredictable world in which we live no guarantee of any such thing is possible, and that nothing can provide real redress for loss of life, or indeed for many other great catastrophes.

Mistakes occur in all fields

regardless of whether there is a code of professional conduct governing those responsible; planes crash, bridges fall, patients suffer, needlessly, millions of pounds get embezzled, and we must live with the fact that the frequency of such happenings can sometimes be reduced, but that they can never be eliminated altogether.

Integrity and skill are excellent things at which to aim, but they are just as excellent for those who work in areas where they cannot aspire to professional status as for those who do. If computing is to become an

established profession, it will have to be based on something more than a mere codification of the sort of standards which should be exhibited by all.

The lack of success which advocates have had in convincing anyone but themselves of anything more than these standards is involved may perhaps be taken as an indication that it will not so become in a foreseeable future.

K. A. JONES  
Welsh National  
School of Medicine,  
Cardiff.

## Cash dispenser net

IN your report on the installation of cash dispensers in the Trustee Savings Bank (CW, November 3) it is claimed that this is the only cash dispenser network in England debiting accounts in real time.

The Cashpoint system of Lloyds Bank was introduced in December, 1972, and has always been based on an online real time operation. We find it surprising that you should report an event as a breakthrough some five years after our introduction of Cashpoint.

Lloyds Bank has always maintained, in the face of considerable opposition, that the only system acceptable to bank customers must rely on real-time authorisation from a central database containing up-to-date information.

We have some 800 machines installed, and an ever-increasing number of Cashpoint cards in issue provides the evidence of our decision in 1972 was correct.

G. B. HAGGE  
General Manager  
Lloyds Bank, London.

## OP SPOT By Bernard Allen

## Role of the job control section

THE job control section has a vital part to play in the day-to-day running of an installation. Its role is fundamentally that of co-ordinator between the user and the computer room, and in doing this it should provide the user with a service and the operators with any information they need to carry out their function.

Any jobs submitted through the job control section should be accompanied by an adequate level of documentation informing the operators of the requirements of the job. The facts related should include disc usage, tape requirements, priority and any special requirements and deadlines to be met - anything, indeed, which will save the operator time.

The service the section provides for the user should be of a particularly high standard. He should be able to find out the status of his job, the state of the system or the likelihood of obtaining machine time at short notice, and should his job be returned incomplete, the section should endeavour to find the cause.

The job control section should be constantly aware of what is happening in the computer room and provide an efficient method of controlling the flow of work within the installation.

There are several methods by which the section can communicate with the computer, some of which are obviously superior to others. It seems ridiculous that job control personnel should actually have to visit the computer room in response to user inquiries. Yet in some installations this is the case.

To keep in touch with events

in the computer room it is a good idea to maintain and update a chart of system resources. In doing this the section can keep a record of any units which are under service, and act accordingly should this affect work flow. Similarly, this scheme can be employed when planning work, which is often done a week or so in advance.

An excellent idea is to have a console or similar device within the section, providing job control with a method of direct inquiry into the state of the system. This, of course, is a moot point, because operators sometimes feel that job control will want to use this facility for the wrong reasons. They may feel that their position is being undermined.

Many installations support large TP networks, and the situation is chaotic when the system is down or in a loop simply because the users are simply because the users are not informed promptly of what is happening. When this happens, users often inundate the computer room with inquiries when in fact the job control section should handle the matter. A method of informing users quickly when a system fault occurs should be devised.

In some installations operators are given the chance to spend time in the job control section, and this provides them with a better overall view of the manner in which the installation is organised and run. It also enables them to consider the problems faced by the job control section, and the relationship between the operator and the section is often strained. And the result is a lack of awareness of each other's problems.

## They all talk the same language.



## MARK IV

Whatever their business, wherever they are, they all talk the same language. They're members of the world's largest software product user group - 1200 leading installations on every continent, who have chosen Informatics MARK IV Systems.

**60 to 80% savings.** MARK IV is today's leading software implementation system, because it gives management the information it needs, when it needs it. At 60 to 80% savings in time and cost compared to conventional programming methods. That's been proved during a decade of cost-effective use.

Over the years, MARK IV has been continuously updated, with over 1500 improvements and 19 major releases. Today, it's by far the most comprehensive and versatile software product available, with transparent interfaces and on-line query facilities to the DBMS in widest use.

**0-70 in 15 years.** MARK IV Systems are developed and maintained by Informatics, the world's largest independent supplier of proprietary software products - and one of the fastest-growing. In just 15 years Informatics have expanded from a small professional service company into a \$70 million global operation. Informatics now offer over 20 software products as well as a wide range of professional and data services. We keep adding to the list.

**Wide product range.** For example, we've introduced MONITOR IV™, a family of advanced teleprocessing monitors, including INTERCOMM™, BETACOMM™ and MINICOMM™. SHRINK™ the data encryption system, for data transmission and the ultimate in data security and storage optimisation. SERIES IV™ today's most flexible distributed processing software system for data entry and validation. ACCOUNTING IV™ general ledger, accounts receivable, accounts payable, the easy-to-install, comprehensive and expandable financial accounting system.

Your DP operation is results-oriented. Informatics products are, too. Which is why it will be worth your while to see us about your software needs, and the Informatics products that suit them best. You'll find we talk the same language.

Please send me documentation on:  
☐ MARK IV Systems ☐ Other Informatics software products. (Please specify) \_\_\_\_\_

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
Tel. \_\_\_\_\_  
Computer \_\_\_\_\_ Operating system \_\_\_\_\_

INFORMATICS (U.K.) LTD.  
Farrer House, College Road  
Harrow, Middx HA1 1BC/UK  
Tel. 869-0088 Telex: 8819495

Informatics

## SPECIAL LOW PRICE ARRANGEMENTS FOR VISITING OVERSEAS TRADE FAIRS

IPC Electrical-Electronic Press Ltd., the world's largest publishers of computer, electrical and electronic journals, have made special arrangements for readers wishing to visit important overseas trade fairs. The cost, in most cases, is little more than the normal air fare but includes - travel by scheduled airline from Heathrow and Manchester \* first-class hotel accommodation \* arrival and departure transfers \* admission to the trade fair \* services of an experienced tour manager. The current programme comprises the following tours.

To obtain a brochure and booking form, tick the box against the tours in which you are interested, complete the coupon and post to the exclusively appointed travel agent, Commercial Trade Travel Ltd., Carlisle House, 8 Southampton Row, London WC1.  
Telephone: 01-405 8668 or 01-405 5489

INTERNATIONAL ELECTRONIC COMPONENTS <input type="checkbox"/>	Paris	April 3-8
HANOVER FAIR <input type="checkbox"/>	Hanover	April 19-27
COMPEC EUROPE <input type="checkbox"/>	Brussels	May 9-12
SICOB <input type="checkbox"/>	Paris	September 20-22
ELECTRIC VEHICLE EXPO <input type="checkbox"/>	Philadelphia	October 3-5
NUCLEX <input type="checkbox"/>	Basel	October 3-7
ELECTRONICA <input type="checkbox"/>	Munich	November 9-15

Please send details of the tours indicated above

NAME \_\_\_\_\_ COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_ Telephone \_\_\_\_\_

01-405 8668



## Siemens in joint venture with AMD

THE joint venture company formed recently by Siemens and Advanced Micro Devices (AMD) may still lack a name to operate under, but is not without plans.

Two facilities are to be established, one in Sunnyvale, California, and the other in Munich, West Germany. Each will be located close to its respective parent company to draw on its expertise when necessary, and their first task will be in development work for the microcomputer systems, systems components and software products it plans to introduce.

Although there will be considerable collaboration between the two facilities, each will undertake development work that is geared to its own marketplace. As both Siemens and AMD hold Intel second source agreements, the early products of the new company will undoubtedly be based on 8080 processor devices, but as both parents are also integrated circuit manufacturers there are plans for greater collaboration in the future, including joint IC developments.

The joint venture follows Siemens taking a 17 per cent share stake in AMD for \$22.5 million. The share price, \$45 each, was established by monitoring the market price for AMD over a period of 90 days before closing the deal. This left Siemens paying an actual 85 per cent premium for the shares, as they fell after the deal was closed.

To be headed by AMD president, Gerry Sanders, the joint company has an equity of \$5 million, and is 60 per cent owned by Siemens. In addition, the Germans have put in a further capital of \$3 million.

### Portable machine

A PORTABLE 16-bit microcomputer configured around the new half-card Digital Equipment LSI-11/2 should be available early next year from Gamma Telecommunications of Wokingham which represents the US firm, General Robotics of Hartford, Wisconsin.

The portable machine will be able to run DEC's PDP-11 systems software. A range of microcomputers based on the LSI-11 will be introduced early next year by Heathkit of Gloucester (CW, July 21).

## Intel to cut prices with new devices

INTEL is launching a dual attack on the microcomputer market, with the announcement that the 8086, 16-bit device will commence customer sampling during the first quarter of next year, and the news that savage price cuts, coupled with new introductions, are being made in the single chip, 8-bit market.

The 8086 is software and peripheral compatible with both the 8080 and 8085, 8-bit processor families, although to obtain the best results from the part, code translation will be required. This will give a throughput increase of between 10 and 15 times the 8080, which the company claims will give it a similar processing capability to the PDP-11/45. Without code translation, throughput will be increased only around 5 times.

The part will also have an increased, but unspecified, instruction set, which will include some compiler statements to which the CPU will respond directly. To accommodate these, a new version of Intel's PL/M

high level language is being prepared, to be known as PL/M 86. It will not employ memory to memory architecture, using registers instead.

Peripheral compatibility is attained by designing the part around the 8085 I/O bus, though the key to this may well be the use of the new 8089 I/O processor device, which is not scheduled to appear until the third quarter of 1978. This will link 8080 peripherals and the MCS-86, the microcomputer system to be based on the 8086 processor. The address capability will be a maximum of 1 Mbyte, and 50 nanosecond memory devices can be worked directly.

Software and hardware development will be possible on the existing MDS-800 development system, and a range of SBC-86 single board computer assemblies will be available. These are virtually the same as the SBC-80 boards, and are basically just awaiting the arrival of the processor.

In common with the 8080 and 8085 processors, the 8086 will be able to use Intel's Multibus bus structure which, with 5MHz operation, will allow the construction of a multiprocessing system incorporating up to 16 master processor boards, in any combination of the 8080, 8085 and 8086.

As a derivation of the 8086, Intel will also be introducing the 8088 part during the third quarter, which will have a similar 16-bit internal configuration to the 8086, while having an 8-bit external data bus.

In the single chip microcomputer market, where the majority of use is found in high volume industrial and consumer control applications, the company is launching a two-fold attack, combining savage price cuts on some products with the introduction of new devices.

From the small to medium scale user, categorised as an annual consumption of up to 10,000

units, there is a growing trend to use the 8748 EPROM version of the 8048 microcomputer in a production role. Designed as a development tool using EPROM memory rather than masked ROM, the device has found increased use with companies having several small volume applications for the one device where its increased cost can be traded off against mask generation costs for the ROM on an 8048. In consequence, Intel has cut the 100 up quantity price from £200 down to between £27 and £33, depending on variant.

The pricing on Intel's EPROMS has also been chopped, with the 2716, 2K by 8 bit now down to £27.40, the 2708, 1K by 8 bit to £12.90 and the 2758, all 5 volt 1K by 8 bit to £13.70—all in quantities of 100-up.

The new introductions are aimed at taking the company a step nearer its goal of achieving a single chip "system" rather than single chip computer for control applications. The first is the 8021 processor, for which sampling has just started. This, basically a stripped down 8080 device, housed in a 28-pin, rather than a 40-pin, package.

The main difference is that the 8048's capability for expansion to off-chip data memory has been removed, leaving it with the on-board 1K byte ROM and 64 byte RAM only. Input/output lines have also been trimmed down to 21 lines. Intended specifically for consumer control applications, it features a pin as a zero crossing detector together with two high voltage drivers. In quantities of 100K the device will be priced at £1.

Spreading in the other direction from the 8021, the second introduction is an upgrade of the 8048 device. Known as the 8048S this features 2K bytes of ROM, 128 bytes of RAM, and has a 10MHz clock frequency. This gives the device an instruction cycle time of around 1.5 microseconds, and a two-time speed improvement is planned.

## More 4014 options

THREE enhancement options are to be introduced next year by Tektronix for its 4014 video terminal. Each will be based on a Motorola 6800 microprocessor, and up to 32K bytes of RAM.

The minimum enhancement, known as Option 40, equips the terminal with a programmable keyboard, display scrolling and new communications parallel generation facilities can be combined to provide complex symbols assigned to a particular key. This is particularly useful where repeated use of that symbol is required, as in applications such as electronic circuit design.

With 32K bytes of memory installed, up to 10K vectors can be accommodated for graphics or symbol generation purposes.

## Range of I/O boards

DATA acquisition and analogue output boards that are compatible with a wide range of microcomputers have been introduced by Analog Devices. Each board in the range has been designed to emulate the functional, mechanical and electrical parameters of counterparts produced by Texas Instruments, Pro-Log, Intel, Motorola and National Semiconductor.

The boards offer a variety of functions, ranging from multiple input data acquisition and multiple analogue outputs, to providing a combination of these. A total of nine boards have so far been introduced by Analog Devices, and further additions are planned. For the Pro-Log 4 and 8 bit microcomputers, the

current range includes a 16 channel data acquisition board and a 4-channel analogue output board, for the Intel SBC80, MDS and the National BLC 80 microcomputer families there is a 2 or 4 channel, 12 bit analogue output board and a 16 channel, 12 bit data-acquisition board.

Three boards are available for use with the Motorola 6800 series, these being a 16-channel high speed analogue input board, a 4-channel analogue output board and a complete 16-channel I/O subsystem. Finally, for the Texas Instruments TMS9900/1000 microcomputer there is a data acquisition board and an analogue output board.

## ONLINE SYSTEMS

# Terminals will be as familiar as telephones

By H. Holman Hunt

THE forecast figure on terminal population, produced last year by Pictel for the Eurodata Study, shows that by 1985 some two million terminals will be installed in Europe. In the UK, the figure on a conservative estimate, is expected to be 400,000. Of course, part of this huge growth in terminal population can be aligned to the growth of the computer industry as a whole but the terminal figures are proportionately so much higher than those for mainframes and other equipment that the reasons bear some examination.

In order to do this, it is interesting to return to the Eurodata Study and examine the way in which these forecasts break down for major industries, looking not at increases in existing applications but at the new applications which are looming on the horizon.

It has widely been predicted that, during the 80s, a deep and fundamental change will take place in industrially developed society. This stance is argued most cogently by Harvard sociologist, Daniel Bell, in his book "The Coming of Post-Industrial Society", where he claims that our basic resource of the 80s will be knowledge and not raw materials; information and not energy. Thus we stand on the threshold of a major transition in basic social structure which will have a far reaching effect upon the computer and telecommunications industry on which, inevitably, will fall the responsibility of managing this vital resource.

The predicted growth of the information industry will, of necessity, lead to the growth of online systems, as both the number of databanks and the users needing to access information from them, grows. This growth in the number of online information systems will be paralleled by a growth in the size of such networks, as efforts are made to spread the high cost of their development over a large number of users.

Eurodata, the scientific and technical information service developed by the Commission of the European Communities, provides a symbolic focal point for this type of network and it is likely that, as Eurodata goes live next year, it will increase awareness of information at all levels throughout Europe.

At the other end of the scale, information networks on specific commercial subjects are springing up throughout individual countries. Here in the UK we already have systems for stockbrokers to access information on the market, for insurance brokers to find out the

most favourable premium rate from the large insurance companies and, as anyone who listens to commercial radio knows, a widely advertised system for buying a car covering a number of agents. The last quarter of this century will see a growth in these services.

At the same time, within the conventional office environment, the number of private networks is rapidly increasing as

"Batch is a bitch" was the startling advertisement slogan recently used by Data General. And never was a truer phrase coined by an advertising copywriter.

Batch processing was the curse of the early computer implementations and the cause of much of the bad reputation which caused the computer slump of the early seventies.

It is self-evident now that online systems are the answer to so many user needs, although there are still some bulk processing applications where batch has its role.

This supplement looks at some online applications and the terminals available. In this opening article, H. Holman Hunt, managing director of Pictel, puts the online revolution into a wider social context, looking to the future and the way in which online terminals could affect the home and work environments.

He foresees a future in which computer networks will crisscross the country in the same way that the national grid does now, and the computer terminal will become as familiar to the general public as that well-known online terminal, the telephone.

end of each check-out line. These, in turn, are linked to a computer either in individual stores or at group headquarters.

The scanner reads the price and other details from the bar-code on the package while the intelligent terminal computes the bill, gives the customer change and, by sending the details of the purchase down the line to the computer, amends stock records and deals with the accounting function.

Now that the EEC has decided upon the form of the European version of the product code and the manufacturers have adapted equipment to cope with the changes made necessary by differing currencies, it cannot be long before such systems will start appearing throughout the UK.

It is also likely that future trends in online systems will provide a link between the retail and banking sectors before long. A recent study of Electronic Funds Transfer Systems predicts a massive growth in three major types of banking automation terminals; online teller terminals, automated teller machines and point-of-sale devices.

While the first of these, OLTTs, are located at a teller window in a bank and provide real time access to a customer file; and the second, ATMs, perform the same function but do so automatically and can, therefore, be located outside a conventional bank; the PoS terminals are located directly in a store or supermarket. These devices perform check verification, credit or instantaneous funds transfer without currency or cheques actually changing hands and the transactions are accomplished when the customer presents a magnetically coded plastic card.

The concept of a computer terminal in every home is less futuristic than might be supposed since the teletext-adapted television set is really nothing less than a receive-only terminal. The large manufacturers plan to launch these sets at the Audio Fair next year and prototypes are already being demonstrated in several shops.

Once the Viewdata network has been established and the vast majority of houses are equipped with teletext TV sets, there is no reason, apart from Post Office policy, why they could not interface with each other, allowing communication between subscribers and providing a system for electronic mail to be implemented.

Thus, unless there is a major and unforeseen change in the way industry is moving, networks will crisscross the country in the same way that the national grid does now, and the computer terminal will become as familiar to the general public as the telephone.



H. Holman Hunt, managing director of Pictel, has been with PA since 1962, and in 1968 he set up a computer consultancy service within PA which has grown under his leadership to become a group of experienced professionals organised in three categories: Computer Consulting Division, Software Division and Operational Research Division. These divisions now constitute Pictel UK.

Holman Hunt is a Fellow of the Institute of Administrative Management, the British Computer Society and is a fellow and Past President of the Institute of Management Consultants.

management becomes more aware of the importance of timely and accurate information. The paperless office is no longer the pipedream of the equipment salesman and, even for small companies, word processing, accounting and management reporting systems are going online and achieving tangible benefits.

In the industrial sector this trend is being further compounded by the swing to distributed processing and the use of mini and microcomputer systems, online to each other or to a large head office mainframe. The Eurodata figures for process manufacturing and discrete manufacturing combined show an increase in the number of terminals from 80,000 in 1976 to 433,000 in 1985.

The biggest increase in forecast number of terminals lies within the retail and wholesale sector, from about 40,000 in 1976 to 362,000 in 1985. In the US, where a nationally accepted product code has been in existence for a number of years, several large supermarket chains have established point-of-sale systems using scanners and terminals at the

## Whatever your application, DELTA have a display system to suit you

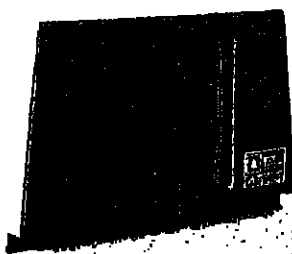


### DELTA 4000

Our standard terminal which gives you full editing facilities, paging, synch/asynch transmission and programmable function keys within the long list of standard features.

### DELTA 4050

The data communications terminal designed for multi-drop networks. Proven replacements for BURROUGHS.



HONEYWELL and UNIVAC displays. Includes Line Monitor for efficient system de-bugging and troubleshooting.

### DELTA 4300

Our Text Processing terminal which includes automatic Ragged Right Justification, powerful search and replace facilities and up to 8.5K characters of display memory in its comprehensive features list.

### DELTA 4500

Full user programmability makes the 4500 ideal for "intelligent" terminal applications and for the development of customised display programs.

### DELTA 4700

Our floppy disc-based terminal system which gives total flexibility for information retrieval and word processing applications. Up to 1.5Mb of local storage all packaged in an attractive workstation.

**Delta Data Systems Ltd**  
Swallowfields  
Welwyn Garden City, Herts AL7 1JD  
Tel: Welwyn Garden 33833

## ON SHOW AT SYSTEMS '77...



Whatever your field of activity or your application, the Megadata 'System 700' is adaptable to your needs, and ensures full compatibility with already existing equipment, thus considerably improving the systems overall efficiency.

**Eurotech**

EUROTECH INTERNATIONAL LTD  
WOLVERHAMPTON, ENGLAND  
WOLVERHAMPTON, ENGLAND  
WOLVERHAMPTON, ENGLAND

Delta Data Systems Ltd

## Instruction manual

THE fifth in a series of instruction manuals on the RCA CDP 1802 microprocessor which covers the use of the Cosmac Software Development Package has been published.

The package is an interactive aid for developing and checking programs for the microprocessor, with facilities that include a cross-assembler, an error checking simulator and a range of debugging tools.

Designated MPM-202, the manual reviews the architecture, organisation, and operation of the processor and describes the two levels of assembly language. It also provides detailed coverage of the CSDP constituents.

The 88-page manual is available from RCA's sales office in Sunbury-on-Thames.

# First edition

Something unforgettable has happened to DEC's LSI-11 and PDP 11/03 computers.

It's the new Intel In-1611 Add In Memory system. Featuring a standard 2 wide printed circuit card up to eight times more dense than DEC's own memory system, the In-1611 represents a real advance in design and economy.

Available ex-stock from Rapid Recall, the In-1611 is available in 8, 16, 24 and 32K models—all with access times of less than 450 nanoseconds. And all units are directly compatible with the DEC systems.

For immediate off the shelf delivery of any In-1611 unit—or for more information get in touch with Rapid Recall (tel: 01 379 6741).

Also available—in 4711 series.

This plug-in memory module provides 16K words plus parity on a single card and occupies only a single PDP-11 card slot. The In-4711 can be used with the PDP-11/04, 11/05, 11/10, 11/34, 11/35, 11/40, 11/45 and 11/50.

The new Intel In-1611 Add In Memory.

pocket sized

intel



Rapid Recall

How to improve your DEC memory

Available ex-stock from Rapid Recall

01 379 6741



# More users turn to online working

THE punched card is dead — long live the online terminal! It isn't quite as dramatic as that, but visitors to this year's Compec, for example, were left in no doubt that the terminal is by far the most important peripheral product and that more and more users are turning to online working for data entry, program development and transaction processing.

For the DP manager with strong enough nerves to handle the development of online, terminal-handling software, the benefits are many. Program statements can be entered more quickly through a screen, and verification is practically automatic. Many users find that programs input in this way, for example, are 100% accurate — a level of accuracy rarely

**RICHARD MILTON** says that this month's Compec left visitors to Wembley in no doubt that the terminal is by far the most important peripheral product, and that more and more users are turning to online working for data entry, program develop-

ment and transaction processing. Here he describes some of the benefits which await the DP manager with strong enough nerves to handle the development of online, terminal-handling software and outlines recent hardware innovations.

achieved with either card or magnetic tape input.

Programs can also be altered much more easily on a screen, and this is a facility which is particularly useful where a number of similar programs have to be produced, varying in some details. It is even possible to write small programs while sitting at the screen.

The reference to the demise of the punched card is, of course, premature to say the least. And if anything, the online terminal

has given this method of data entry a new lease of life as far as jobs like file creation are concerned.

Just what kind of terminal the user will go for depends, of course, on the speed and throughput of his application and on how time critical it is. In the past, remote job entry was a popular way of getting more "mileage" out of an existing mainframe. But the increased price-performance of minis have made them the first choice of

many users for dedicated applications and the RJE terminal is losing favour in some quarters. Remote job entry tends now to be offered as merely one facility among others on the new breed of intelligent terminal.

The microprocessor has meant that greater intelligence in new terminal products is almost *de rigueur* and the current generation of products pack the power of a respectable mini. Aside from purely technical developments, though, there are

a number of market forces pushing display terminals into prominence.

The minicomputer manufacturers have identified the VDU as their biggest selling asset. Ease of program development and data entry, and the immediate impact on the prospective customer of transactions conducted on the screen have contributed, in no small measure, to the mini's appeal and its success in traditional mainframe markets. This has resulted in the mainframe makers themselves (notably IBM, ICL, Univac and NCR) pushing the benefits of online terminal-oriented systems.

Not only the mainframe manufacturers have responded to the challenge of the mini firms. Baric, for instance, recently introduced its Datacare service, in which the user buys an ICL 1500 online terminal as part of a package of bureau services.

Many new ranges of terminals have appeared in recent weeks. ITT business systems, which has been active in the market for some time with an IBM-compatible system, the 3230, has now launched a new video terminal, the 3230, and an intelligent terminal system, the 3630. Hazeltine, following a general trend to cheaper terminals, has launched its H 1500 low price family of VDUs with a one-off price of £800.

Colour has yet to catch on in a big way as far as the professional user market is concerned, but Reading-based Crow has launched several models capable of displaying in high resolution and full colour. The company also produces screens with built in teletext facilities to receive Ceefax and Oracle.

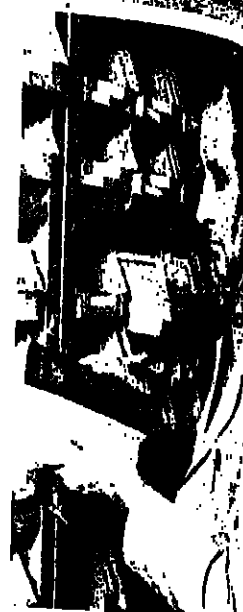
Also active in the colour field is a newly formed division of Gresham Lion which has produced two colour information display systems aimed at applications such as satellite, radar and X-ray scanner pictures.

Also at the low-cost end of the range is the 1200 VDU page printer introduced by Perkin Elmer. Aimed at transaction processing applications, the 1200 includes editing facilities and simplified host computer programming and sells in quantity for £1,100.

Graphics remain a minority interest, but the market is at least active enough for one of the major manufacturers in this field — Tektronix — to have launched two new graphics displays. The GMA 101A and 102A are designed to allow users to do some tailoring to their own needs, but are aimed basically at applications like printed circuit layout, document preparation using different fonts, and high resolution scientific work.

One "all-singing, all-dancing" terminal of interest is the new Diablo 1841 which can act as a communications terminal compatible with IBM's 2741, or can be used in an APL application, and which also has a sufficiently sophisticated graphics capability to enable it to print out music.

Probably the most interesting technical development, and one which may well catch on in a big way in future, is the hand-held or portable terminal. These are not too thick on the ground at present, but promise exciting things. Data Recognition has developed a portable data capture device called Dataport 3 which can be used both to store and to retrieve data and so communicate with a host mainframe.



Data Recognition's portable terminal, Dataport 3, in use for terminal control. Micros man the terminal is growing smaller.

Built around a 16-bit microprocessor, the device can store up to 20K characters in its semiconductor memory on a removable cassette. It has a search facility to retrieve display data on a 18-character alphanumeric display and also transmit data to a mainframe via telephone lines up to 2400 baud.

The manufacturer says the device is aimed at applications such as stock control, warehouse staff control, inventory control and picking lists, and is by people such as sales representatives who could transmit orders from the customer premises using an acoupler.

The portable terminal is interesting because it immediately brings to mind the recent of the electronic calculator — a lesson which will be uppermost in the minds of electronics manufacturers only has the microprocessor provided the technical means to construct cheap, pocket-sized terminals, but major forces are at work pushing manufacturers to use this technology.

By next year, numerical services will be available to the public — services such as Viewdata, Ceefax and Oracle. Initially, these services are concerned only with the gathering of information and news, but ready numerous commercial companies are planning to use teletext to sell houses, cars, boats, and many other items.

When the domestic receiver, in conjunction with a telephone, becomes available as a "transaction centre" in the home, the day of the domestic video terminal will have arrived.

Another driving force for personal computing, although some four persons per computer systems are on offer to enthusiasts, the cheapest of which is no more than £800. Some of these systems convert the domestic TV receiver into a data terminal by means of a plug-in microprocessor, in much the same way that a personal computer can be converted into a game machine.

Many sceptics believe that the average domestic computer simply does not have the disposable income to engage in personal computing, yet the cheques are rolling into the firms that have ventured into the field. And with the calculators and digital watches — with results that can be seen in every high school — it is likely that within two or three years the personal computer manufacturers will have produced a solid state, hand-held, microprocessor-based, electronic apparatus which could be used both to store and to retrieve data and so communicate with a host mainframe.

The choice of terminals is usually dictated by the application, the amount of money available or some combination of the two. Most people are impressed by the speed, clarity and ease of use of the expensive visual display unit, but for many applications they are either unnecessary or inappropriate and there is still plenty of scope for a good typewriter. Whatever variety you select there is bound to be a wide choice of models from a number of manufacturers and a corresponding wide range of prices.

Perhaps the safest bet for the first time user is to choose the one advocated by his mainframe supplier, even if it is the most expensive, thereby procuring plenty of "free" assistance while installing the online system. You can always consider a cheaper and/or more reliable model later and this should serve to keep the giant on his toes.

# All you need at push of a button...

By Richard Creer

SO it has been decided at last, for reasons practical, political or emotional, that your installation is going to have an online system. After years of happily punching cards and printing paper at the central computer department, it is at last cost-effective for the people in sales and marketing, personnel, the loading bay and the boardroom, to get the information they need at the push of a button.

No more forms to fill in, errors to correct, hundreds of pages of sub-totals to wade through just to find the figure they want. Simply type in the right code on the friendly little TV screen and bingo! The answer appears as if by magic. Isn't technology wonderful?

But, of course, it isn't magic at all. The information that someone wants is stored away on a record in a disc file in a remote corner of the computer room. Between that record and the shop floor a long and tedious chain of hardware and software must be planned, installed and tested. What's more, each link in this chain must be highly reliable.

Failure in the overnight run of a batch system can, with luck, be recovered from in time to prevent it from having an adverse effect on company operations. Failure in an online system is immediately apparent — when you press the enter key and nothing happens. The result is one frustrated and unhappy clerk and a DP manager looking for an explanation.

As a first time user, you will have no practical experience of building this chain, but you will presumably have acquired a good deal of theoretical knowledge from various courses and seminars attended. Your confidence will also, no doubt, be bolstered by the fact that many have taken this path before and succeeded, although you may still have a few lingering misgivings about the whole scheme, caused by stories of other people's expensive and embarrassing failures.

What can be done to maximise the chances of your first online implementation being successful? One of the most important factors is the selection of the initial application. Ideally, it should be one that requires a minimum of system design and programming effort, no complex restart or recovery facilities and one where system reliability, though desirable, is not of paramount importance. It would also be of considerable advantage if the delivery date for the system were not critical.

What kind of application fulfils these requirements? None better than a straight forward inquiry on an existing master file. Such an application embodies most of the fundamental features of all online systems — direct file access, operator communications, rapid response — but without the multitude of complications that can arise from real time file updating. Also, since the user ready has some means of interrogating the master file via batch systems, there should be less pressure on the online development team to "come up with the goods" and there will be something to fall back on should troubles strike during the "running-in" period.

The choice of terminals is usually dictated by the application, the amount of money available or some combination of the two. Most people are impressed by the speed, clarity and ease of use of the expensive visual display unit, but for many applications they are either unnecessary or inappropriate and there is still plenty of scope for a good typewriter. Whatever variety you select there is bound to be a wide choice of models from a number of manufacturers and a corresponding wide range of prices.

Perhaps the safest bet for the first time user is to choose the one advocated by his mainframe supplier, even if it is the most expensive, thereby procuring plenty of "free" assistance while installing the online system. You can always consider a cheaper and/or more reliable model later and this should serve to keep the giant on his toes.

When it comes to selecting that other essential piece of teleprocessing hardware — the telephone line — the choice for most of us is considerably more restricted. All I can advise is order early.

Having sketched out your hardware plans, it is time to turn your attention to software needed to support it. Here again products are proliferating and there are several good teleprocessing monitors on the market, all proclaiming their relative merits in the areas of price, performance, reliability and so on. You can perhaps narrow down the field by discarding those which do not support your particular choice of hardware.

If you already have a database, you will probably want to have online access to it. If not immediately then at some later stage of development. "Bridges" have been built in various directions between some of the database packages and some of the teleprocessing monitors, so the availability of such a link is an additional selection criterion. A word of warning though — make sure that the bridge is actually installed and working somewhere, rather than just "planned", or you may find yourself helping with its construction.

Other less tangible factors that should be taken into account include the availability and quality of training for your current programmers and analysts and the size of the pool of experienced people from which you may want to recruit new staff. The latter is roughly proportional to the number of existing users, and there are some pretty convincing arguments for selecting one of the more popular online packages.

If you don't already have a database but plan to install one, then the arguments presented above would, of course, still apply but in reverse — choose a product that has been proved to work well with your TP monitor. Whatever the attractions of these two items of software are when considered individually, they will be found to be far outweighed by the advantages of having them work well together.

Staffing your first online application may present some difficulties. Unless you have been particularly fortunate in your recent recruitment programme you are unlikely to have much in the way of in-house skill. Training existing staff in the new techniques required and

drafting in outside expertise, either permanently or temporarily, should produce a balanced team. By working with people who have "done it before", those with no previous experience will certainly learn more rapidly than through any amount of trial and error.

Having assembled, or at least planned the assembly of, all the necessary hardware, software and personnel components, you are now in a position to embark on the system design and programming. For reasons which are often difficult to identify, these processes tend to take far longer than would be expected. Parallels with batch systems of superficially similar

complexity seldom seem to hold true and progress, particularly in the early stages, is frequently exasperatingly slow as various system design blind alleys are explored.

Certainly the dictum that "when you start writing online programs, 80% of your batch programming experience becomes redundant" seems to be correct. While that missing 80% is being learnt, much time and money can be expended on unsound system design and programming strategies. This is one area where expert advice can help you avoid most of the pitfalls.

One aspect which is often given too little emphasis when



Richard Creer, who has eight years' data processing experience, six of these on teleprocessing systems both in this country and the US — discusses here what can be done to maximise the chances of your first online implementation being a success.

Creer specialises in database systems on IBM hardware, and has spent the last two years providing advice and practical assistance to TP users as an independent consultant. Recently he formed Circle Computer Consultants Ltd with four other previously independent TP consultants.

designing systems, both batch and online, is the specification of performance criteria. In a batch environment, poor system design can, and often does, significantly increase the processing time. This may or may not be important depending on factors such as how often the application is run, and how much spare computing capacity you have.

The user need never know that a job which started at midnight ended at four in the

morning instead of two. But in an online environment doubling the processing time is immediately apparent as an unacceptably long response time at the terminal. Fifteen seconds may not seem long if you are working at a desk, but if you can feel like eternity when you are sitting in front of a terminal. So, it is a good idea to establish an upper limit for system response, to bear this

● Turn to page 18

## Most people already have a Reality user's manual



Reality understands English. So the obvious place to find the right words for Reality is an English dictionary. Choose the most useful words: check, sort, list, control, inventory, value, together with those particularly associated with your type of business. It's as simple as that.

Reality is a computer-based data management system which stores centrally all data required for an operation (business, factory, warehouse, accounts department) and allows anyone interested — not just data processing professionals — to access and update files whenever necessary using an easy to operate TV-type screen or printer.

What's more Reality can be used wherever the work is being done. And as many enquiries can be made simultaneously as there are terminals on the system — providing the security password is tapped in first.

## If you can speak English then Reality will answer back

However, Reality understands more than just English. For the EDP specialist it copes with high level application-oriented languages such as DATA/BASIC or RPG11.

And there is the useful PROC — a job control language which enables a whole series of operations to be originated with a single command.

Sales Order Entry, Stock Control, Accounting, Production Scheduling, Inventory, Sales Records, Payroll, Credit Control... Reality can look after all these business manoeuvres and many, many more.

If you're interested in saving cost and increasing efficiency then fill in the coupon (telex or phone 0442 61265 Ext 202) for more information and an opportunity to see Reality in action.

**REALITY from CMC**

Please send for my attention more information on the Reality business system.

I would like to see a demonstration of the system.

Name

Position

Company

Address

Telephone

Postcode

City

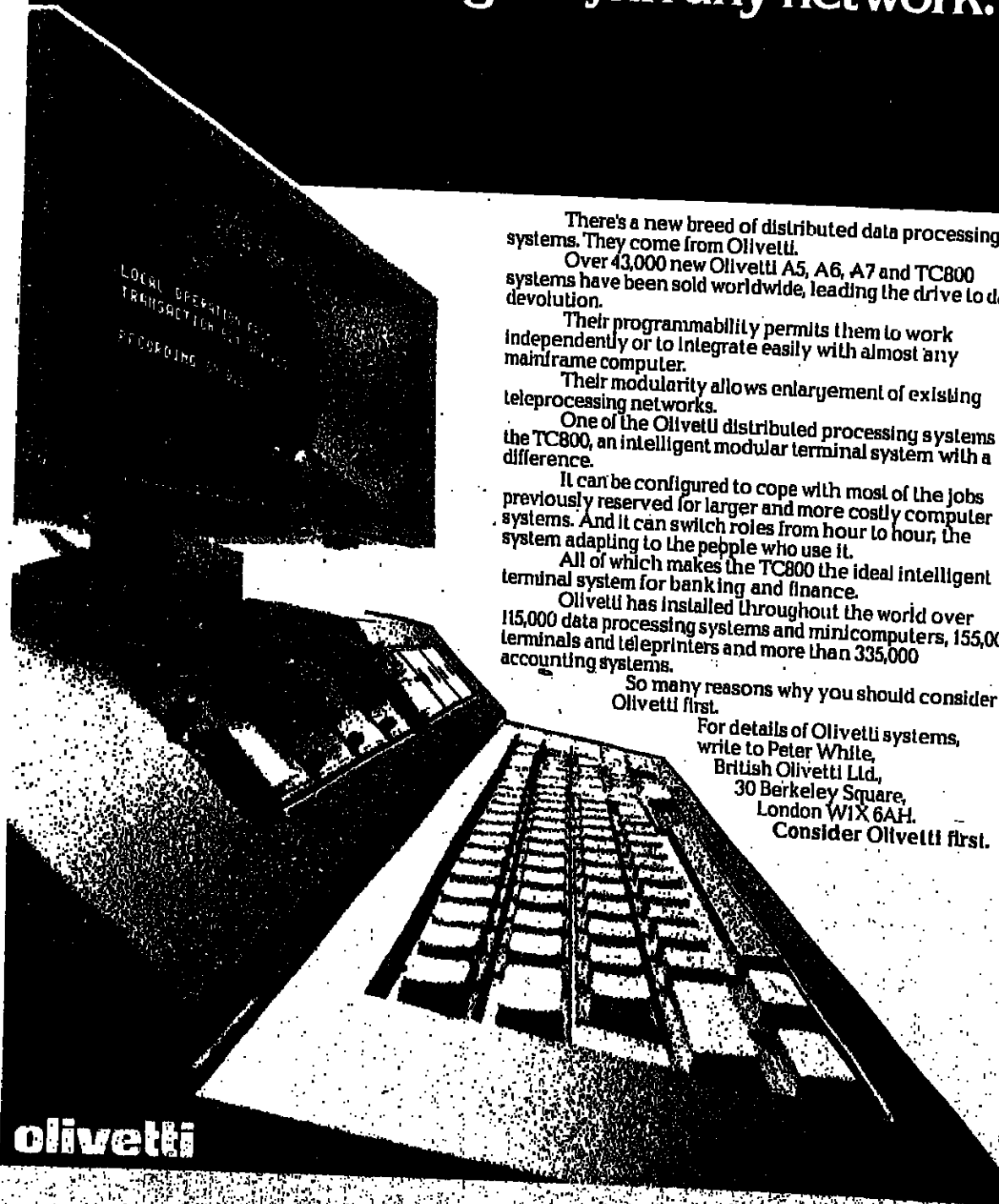
Country

Comments

Office 1124

## Olivetti Systems.

Intelligent enough to work on their own. Adaptable enough to join any network.



There's a new breed of distributed data processing systems. They come from Olivetti. Over 43,000 new Olivetti A5, A6, A7 and TC800 systems have been sold worldwide, leading the drive to data devolution.

Their programmability permits them to work independently or to integrate easily with almost any mainframe computer.

Their modularity allows enlargement of existing teleprocessing networks.

One of the Olivetti distributed processing systems is the TC800, an intelligent modular terminal system with a difference.

It can be configured to cope with most of the jobs previously reserved for larger and more costly computer systems. And it can switch roles from hour to hour, the system adapting to the people who use it.

All of which makes the TC800 the ideal intelligent terminal system for banking and finance.

Olivetti has installed throughout the world over 115,000 data processing systems and minicomputers, 155,000 terminals and teleprinters and more than 335,000 accounting systems.

So many reasons why you should consider Olivetti first.

For details of Olivetti systems, write to Peter White, British Olivetti Ltd, 30 Berkeley Square, London W1X 6AH. Consider Olivetti first.

olivetti



## ONLINE SYSTEMS

# The solution to an advertising problem

By Laura Tatham

ALMOST all the activities of an advertising agency that are not directly creative generate a mass of paperwork that is complex, volatile and highly time-dependent. It therefore seems strange that although many agencies use batch computing, only a handful have yet exploited the possibility of online computing.

Occasionally this omission may be due to ignorance. More often it is the inability to afford an in-house system of any kind. Fewer agencies still could find the resources to develop, operate and maintain an online system which, to be fully cost-effective, would probably be too elaborate for a minicomputer to handle.

Several agencies in London, however, have found that a comprehensive online service known as Medline provided by

Donovan Data Systems provides a highly satisfactory solution to this problem.

Donovan is an independent bureau company with clients in North and South America, two European countries and the UK. The bureau service is unique of its kind in the UK and is dedicated to the work of advertising agencies and, to a lesser degree, market research agencies.

Situated in Mayfair, London, Donovan's computer centre is equipped with an IBM 370/135 with 500K bytes of main store and front-ended by an IBM 3704. At present a total of 22 video terminals, split roughly equally between IBM 3270s and ITT 3280s, are linked to the system, all but two being in users' offices.

This total will reach 30 by the end of December, and by April

1978 it will be 42, says Roy Tinker, vice president and UK general manager, who is also planning to upgrade the mainframe to a 370/158 by the end of next year.

In casting in their lot with Donovan, London advertising agencies, such as J. Walter Thompson, French Gold Abbott Kenyon & Eckhardt, and BBDO, etc., are following the American example, where more and more agencies are closing down their in-house installations. Some 30 of them, including 15 of the top 20, are Donovan clients, using nearly 300 video terminals and a countrywide data communications network.

The non-creative activities of advertising agencies can be

summarised under three broad headings. First is campaign planning. This involves selecting the media which, in the agency's judgment, will give the client's message the most effective impact, subject to budgetary limits and other constraints such as the need to co-ordinate with a new product launch.

How many media are relevant depends on the nature of the product or service. Nevertheless, the list of possibilities runs into hundreds and the total available into thousands. The structure of charges for advertising is also far more complex than a layman might suppose.

Rates will differ, for instance, according to position in a

publication or time-slot on the air, the size of space or amount of time required and whether a single ad or a series is booked. Though final decisions must, of course, depend upon skill and judgment and cost alternative schedules are obviously of considerable value.

Secondly, there is the recording of the selected bookings which is also the basis for client and other accounting. In the advertising business, cancellations and changes are frequent due to factors varying from second (or third or fourth) thoughts on clients' part to feedback after a campaign has begun. The problem is therefore similar in the nature to that faced in airline seat reservation. Thirdly, because advertising is fiercely competitive, and clients expect it, the agency must be in a position to quantify the effectiveness of its work. For its own good health, it must also be able to assess the profitability of its clients.

It is easy for the computer-minded to see, — though it is only recently becoming apparent to British advertising agencies — that online operation is the perfect answer in this environment. It is equally clear after talking to Tinker why it is economically impossible for most agencies, if only on the grounds of cost, to build and operate their own systems.

Integration of the records used by the various departments of the agency is necessary, not only in the interests of accuracy and consistency, but to obviate repeated data entry. A large database must be designed, maintained and constantly updated. The program for media scheduling is large and sophisticated and the transaction processing software complex. Donovan's US parent, which initially develops software (though modifications are made locally to suit varying national practices and there is a two-way exchange of ideas) allocated some \$600,000 in 1977 alone for program development and maintenance.

Another factor that militates against the individual user is the need for constant system availability. Over 25% of Donovan's software is oriented towards recovery. As a result, the worst that can possibly happen to a client is to lose a few hours' input. A further safeguard is a standby arrangement with a user of a similar configuration.

## At the push of a button...

From page 17

upper limit in mind while designing the system and subsequently programming it and to ensure during acceptance testing that it has not been exceeded. If performance is not satisfactory, various tools are available for measuring the internal performance of some, if not all, of the TP monitors. Their use will enable you to find out "where all the time goes", and then hopefully tune your system in order to make it perform better. Depending on the amount of work involved, such an exercise can further delay implementation, and it is surely better to get the system design right in the first place.

At last the great day comes. The equipment is installed, the last minute bugs have been ironed out. Those embarrassing

demonstrations when everything goes wrong have been successfully explained away and Gladys in stock control can start hammering away at the keyboard.

And, what do you discover? Almost inevitably the system will not be used the way you envisaged. Nevertheless, online systems are generally popular with non-IT people, perhaps simply because they can tailor them to their own requirements. Maybe you can judge just how popular yours is by the limit it takes before someone comments casually, "wouldn't it be handy if we could change that amount right at the terminal?"

And when that happens, it's out with the feasibility study manual, again, back to the drawing board. Now, where have we find somebody who knows something about what really

Laura Tatham takes a look at a bureau service that is claimed to be unique of its kind in the UK — dedicated to the work of advertising and market research agencies. She says that while it is easy for the computer-minded to see, it is only now becoming apparent to UK advertising agencies that online operation is the perfect answer in this environment.

Users of the Donovan media and accounting service pay a percentage of the media billings processed through the system. Single video terminals, or clusters with a local controller, are linked to the centre by dedicated lines and are rented direct from the manufacturer rather than from Donovan Data Systems.

An increasing number of these are ITT 3280s. While a price about 30% lower than the IBM equivalent with which these are fully compatible, and quicker delivery are undoubtedly a powerful incentive to choose ITT equipment, these terminals also have exceptionally clear and flicker-free display. Their attractive appearance also, perhaps, carries particular weight with advertising agencies.

These terminals are used for online data entry, with real time updating of files where appropriate, and for inquiries. One of the benefits of the Medline service is greatly to reduce paperwork. An interesting spin-off from this is the discovery of creative talent in their previously overburdened staff. Reports and other documents are therefore prepared in demand rather than automatically.

A request made via a terminal for any one of 60 different reports will result in a printer being available for collecting first thing the following morning. Subjects vary from listing of ledgers to budget breakdown and daily traffic details showing all amendments to user files.

As befitts the servant of a service industry, Donovan maintains close and constant liaison with its customers, in order to ensure they get the best possible value from the system and to help solve any problems they encounter.

A useful device in this connection is the ability to call on to a computer centre video terminal (which is constantly attended) an identical display to that currently shown on a user's screen. This facility, in conjunction with a telephone conversation, helps users sort out problems that arise.

## NEWS IN BRIEF

### Quiet power for 3032

ONE of the problems facing IBM users planning a switch to the new 3032 mainframe is the need to provide a power house outside the computer room for the motor-generator power supply. MPL of Hayes is offering an easy way out of the problem with its ML 5471 TQ1 frequency converter, which has been designed to be compact and quiet enough for installation within the computer room itself. The unit provides output of 75kVa at 441 Hz and 208 volts, and is suitable for both the 3032 and 3033.

### Chinese order

THE Peoples Republic of China is to spend \$4.4 million with Electronic Associates of New Jersey, for a hybrid computer system to be used in a simulation/research laboratory. The order, which still awaits US Commerce Department approval, is for a Hyshare 700 system incorporating three Model 781 analogue consoles, a Systems Engineering Laboratories 32/55 computer, Hyshare software and related interfaces. An export licence is being applied for.

### Takeover denial

TALKS have been taking place between minmaker Microdata of California and Olivetti of Italy — but not about possible acquisition, as was reported in the US Press. "They are talking to us about buying products, that is all," Microdata president Don Fuller told Computer Weekly.

### £890,000 upgrade

COMPUTER facilities at Bedfordshire County Council are to be upgraded in a £890,000 move from a Honeywell 2050 to a Honeywell Level 66/10. The equipment will be installed in 1978.

### Airline system

THE 1100/80 system ordered by the Scandinavian airline SAS has been formally announced as a three-processor 1100/83 system. The new machine will replace four Univac 494s (CW, July 7).

### Not for outsiders

A PROPOSAL to allow outside organisations to use Hamilton District Council's Honeywell 61/60 machine has been rejected.

Noise Abatement  
United Kingdom  
November, 1977

Dear DP MANAGERS & FELLOW SUFFERERS

With Reference to NOISE

Are your data input and output devices noisy?  
Then Consult: NIGEL MOSS (our principal researcher) on 01-205 0033, Ext. 23.

He has some positive suggestions!

The Power Equipment Company,  
Kingsbury Works,  
Kingsbury Road,  
Kingsbury,  
London, NW9 8UU

Or if you would like literature send the coupon below to Nigel Moss at PEC.

Company:

Address:

Your name:

Position:

## OPAS makes life easier for telephone operators

ONE of the unsung pioneers of the microcomputer revolution is the UK Post Office. In 1973, the corporation received the first Intel 8080 micro to be delivered in Europe, subsequently helped to debug the Intel PL/M compiler, and in the process telecommunications product with significant export potential. The next step in the development will be the incorporation of a bubble memory backing store.

The product, developed by the Post Office, but engineered for production, manufactured, and marketed worldwide by STC, is OPAS, Operator Position Assistance System.

OPAS is designed to cut out much of the tedious work the telephone operator at present has to do in connection with assisted calls such as credit card, long-distance coin-box, some overseas, and reverse charge calls. As an example, the number of operator tasks in a simple long-distance call-box connection is reduced from 33 to 17.

Conceived from the start as an exportable product and designed to be built into existing operator consoles, OPAS has won its first export order, worth £400,000, in Sweden. The telephone exchange at Orebro, serving most of southern Sweden, is to be fitted with a 30-position OPAS system which will facilitate the work of the operators who have to handle Southern Sweden's large population of radio telephone users.

The OPAS system automates the call set-up procedure once the operator has recorded the calling and called numbers; it records all the information needed for billing, a task at present done manually on cards; it automatically checks that the correct money has been deposited in coin-boxes; and it times calls for billing purposes, for instance when the calling party asks how



A view within the control desk of STC's Operator Position Assistance System. The central small panel contains the electroluminescent screen and associated drive circuitry while the larger board beneath it carries the integrated circuits for control of other functions associated with the main keyboard.

much a call has cost. Its modular design allows a wide variety of other features to be added to meet particular customer requirements.

The compact solid state display on the system is also a British development. It comes from Phosphor Products of Poole, Dorset (CW, October 7, 1976), and uses DC electroluminescence of zinc sulphide particles. The result is a yellow-on-brown display, a combination which was chosen by Datasab for its D16/30 VDU following a major investment to establish the most comfortable colour combination for long periods of viewing.

Each operator control unit contains one 8080 and supports up to eight operators. A further 8080 is used to control each application of the system, such as credit card information handling, maintenance and diagnostics. A 32-position system includes 14 8080s.

"We started programming in a macro language, but switched to PL/M when it became available, partly because we had an eye on the export market and partly because PL/M is widely used in

Europe," Dr Peter Troughton told Computer Weekly.

Dr Troughton is responsible for technical development of the equipment associated with operator services, and conceived OPAS, which within the Post Office is called ACRE, Automatic Call Recording Equipment.

"Our next step will be to add a bubble memory backing store to the system for storing local telephone numbers. We are very pleased that a system developed from the outset with the world market in view should have resulted in such a promising product."

STC will be building the systems to be installed by the Post Office, and the first will go in next year.

STC had to make several adaptations to meet the specific requirements of the Swedish PTT, and looks for business totalling £1.5 million from Sweden.

PTTs in Europe, the Middle East and the Far East are now studying OPAS, and a version for the US market is under consideration.

—Tim Palmer

## Water billing project ends

PARLIAMENTARY REPORT

A £200,000 three-year project aimed at developing a computer system for billing water service charges has come to an end at Warrington, Cheshire, headquarters of the North West Water Authority. The project was carried out by the authority in collaboration with nine other water authorities.

Answering a question from Kenneth Warren (Con; Hastings), the Secretary of State for the Environment Denis Howell (Lab, Small Heath) said it had been decided that the project had reached the point where further development of the systems would best be done by the

individual authorities to meet their own requirements.

Warren asked whether the Department of the Environment could give technical resources to the authorities to enable them to develop a uniform billing service.

Howell replied that he was satisfied that the resources available to the authorities were sufficient.

Installation of solid-state System X stored program telephone exchanges will begin in 1981, Lord Winterbottom told the House of Lords last week. He was replying for the government in a debate on the Post Office.

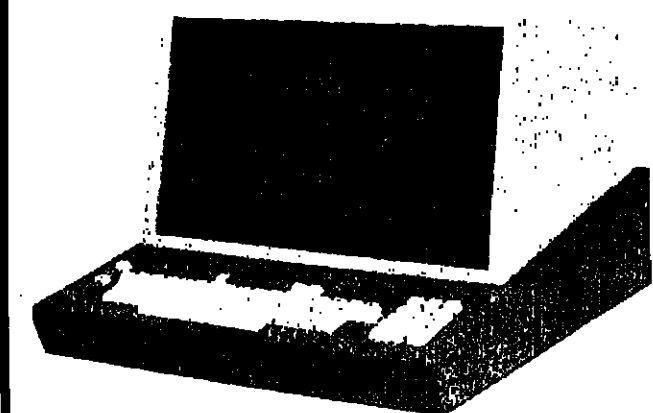
## Fairchild F464 memory

FAIRCHILD F464 dynamic serial memory, thought to be the first 64K bit charge-coupled device to come into the market, is constructed as sixteen, 4K, "serial parallel serial" blocks, in which one bit from any one of the blocks can be addressed.

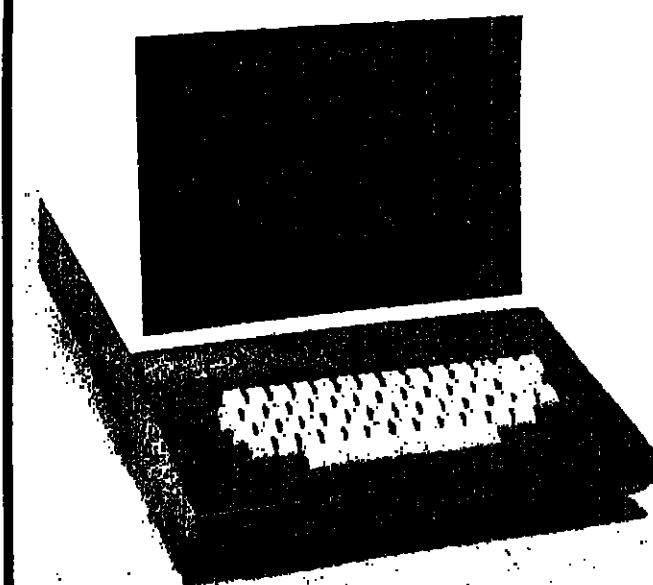
Fabricated in the double-poly-N-channel technology, the memory features 1 TL compatibility on addresses, data to put, wire enable, chip select and data output, and its organisation is such that the device can be packaged in a standard dual in-line package.



FOR THE 6TH CONSECUTIVE YEAR  
NEWBURY LABORATORIES  
LIMITED  
WILL BE EXHIBITING AT COMPEC



THE 7000 RANGE OF LOW  
COST BRITISH DESIGNED VISUAL  
DISPLAY TERMINALS  
WILL BE SHOWN



FOR PERSONAL  
COMPUTING

THE NEWBURY KIT WILL  
BE SHOWN FEATURING THE  
MICRO-VID + OPTIONS

WE WELCOME YOU TO  
STAND U65

NEWBURY LABORATORIES LIMITED  
KING STREET, ODIHAM, HAMPSHIRE RG26 1JN  
Telephone 025-471 2910, Telex 858816

April 1978







# Appointments

## HONG KONG

**PDP 11/70  
PROGRAMMERS  
RSX-11M**

Chartered on-line, Hong Kong's leading data processing service organisation, is seeking the services of experienced programmers to assist with installation of an on-line real time application using dual PDP 11/70 processors.

A two-year contract is envisaged. Benefits include an attractive salary and accommodation allowance as well as travel and relocation expenses. The maximum tax in Hong Kong is 15 per cent. Applicants should write to the Technical Manager, Chartered On-Line Ltd., Asian House, Hennessy Road, Hong Kong.

Interviews will be held in London during December, 1977.

## THE OPEN UNIVERSITY Faculty of Technology

### ASSISTANT SCIENTIFIC OFFICER IN DESIGN

An Assistant Scientific Officer is to be appointed within the Design Discipline, Faculty of Technology. The post is available from January 1, 1978. The successful applicant will be required to work in association with a small research team on a number of ongoing research projects concerned with studying spatial configurations and relational structures relevant to design in a variety of technological fields. A mathematical background in combinatorics and graph theory is desirable. The person appointed is expected to have a good computer science degree with specialist experience in using and writing combinatorial and graph manipulation algorithms in a range of languages including ALGOL 68 and PDP 11 ASSEMBLER. Several years' academic experience as a systems programmer on minicomputers with an interest in design applications is essential.

Salary on the scale £2904-£4190 per annum, plus USS benefits (under review from 1.10.77).

Application forms and further particulars are available, by postcard request please, from The Personnel Manager (S03), The Open University, P.O. Box 76, Walton Hall, Milton Keynes, MK7 6AL, or by telephone from Milton Keynes 63888. Closing date for applications, December 8, 1977.

## NEW BIRMINGHAM SALES OPPORTUNITIES Eurocom Data Limited

A member of the National Westminster Bank Group

### SALES EXECUTIVES and SYSTEMS ANALYSTS

(To market COM in the Midlands)

Realistic on Quota earnings

**CIRCA £7000 + CAR**  
(Basic £4000-£6000 + Commission)

Eurocom Data Ltd. is a fast growing international Computer Output on Microfilm Bureau providing services through 6 centres in the UK and 8 further centres in Europe via Eurocom Data (Holdings) Limited.

Suitable candidates are likely to be successful VRC or Computer Salesmen who have a good working knowledge of Computer and Business systems, and have consistently achieved Quota. However, we would be pleased to train experienced systems/programmers Persons interested in moving to a sales environment.

Applications to:—  
The Personnel Manager  
Eurocom Data Limited  
3 High Street, Rickmansworth, Herts.  
Tel. No.: Rickmansworth 74323

## UNIVERSITY OF BIRMINGHAM COMPUTER CENTRE SYSTEMS GROUP — COMPUTER OFFICERS

The Computer Centre already provides a wide range of local and remote computing facilities to the University. These are now being further extended by the installation of a large dedicated external system for both teaching and research and also by participation in the development of the Midlands Universities Computing Network.

The Systems Group at the Centre will be actively involved in all aspects of these developments. Applications are invited from two posts of Computer Officer in this Group. Applicants should have several years experience in systems software and/or hardware in a service environment, as shown by the successful completion of several projects. Salary commensurate with experience and qualifications. A higher degree is desirable, but clear evidence of previous work successfully completed is equally important.

**SALARY RANGE £2,804 to £4,811** (scale to £6,827 plus superannuation under USS)

Further information from the Assistant Registrar, Science and Engineering, University of Birmingham, P.O. Box 363, Birmingham, B15 2TT, to whom applications in three copies including full curriculum vitae and three references should be sent by 1st Dec 1977.

Please quote Ref. CW22

## STERLING

### SYSTEMS ANALYST (Commercial Systems)

Part of an international group with our headquarters located in rural surroundings, we are one of Europe's foremost designers and manufacturers of industrial electronic control systems for a wide range of industries including oil refineries, steel companies, chemical plants, etc. at home and abroad.

We are setting up a new team to develop a wide range of computer applications, mainly operating on-line. A technical analyst is required to take control of Commercial Systems development including sales, design, entry, sales analysis and sales. The person appointed will not be expected to design but a sound programming background is essential, preferably with on-line experience on ICL 2903-4 equipment.

Applications are invited from persons up to the age of 30 years with at least one year's experience as a commercial systems analyst. An attractive salary will be negotiated and benefits include four weeks annual holiday after one year's service and a pension scheme.

For an application, telephone or write to Mr. J. W. Harding, our Recruitment Officer, Sterling Cable Company Limited, 2nd Floor, Aldermanston, Reading RG7 6DD, Tel. Wolverhampton 3221.

## INSTITUTE OF HYDROLOGY

### SCIENTIFIC OFFICER

(PHYSICIST/PROGRAMMER)

There is a vacancy for a SO at the Institute of Hydrology. The successful candidate will work with a small team engaged on studies of soil water movement. A knowledge of numerical modelling methods is desirable and the ability to organise and work with large computer data files is essential. The primary task will be the organisation of the data base but this will subsequently develop into modelling of soil water processes, probably with direct involvement in field experimentation and instrumentation.

Qualifications: A degree or HNC in Computer Science, Physics or Mathematics.

Salary and Conditions: The appointment will be to the Scientific Officer grade, £2140-£3267 + £313.20 + Stage 2 (maximum £3267.20) plus annual leave, and a pension scheme. A non-contributory pension scheme. A starting salary above the minimum may be offered for relevant qualifications or experience.

The Institute is situated in pleasant rural surroundings and has a staff restaurant, an indoor sports hall and a flexible working hours scheme.

Staff of the Council are not Civil Servants, but their pay and conditions are similar to those of the Civil Service.

Write for application forms quoting Ref. No. 181 to: Institute of Hydrology, Wallingford, Oxon OX10 8BA.

# Datasolve Datasolve Datasolve

## We've made things easy for you!

If you're chasing a new job or a new contract, save time by filling in your application form here and now.

**Personal** Please write in ballpoint, using block capitals.

Surname \_\_\_\_\_ Forenames \_\_\_\_\_

Address \_\_\_\_\_

Telephone Home \_\_\_\_\_ Office (discretion will be used) \_\_\_\_\_

Age \_\_\_\_\_ Place of Birth \_\_\_\_\_ Car? \_\_\_\_\_

Are you prepared to relocate? \_\_\_\_\_ UK/Abroad (delete) \_\_\_\_\_

**Experience** Place the number of years in each box, e.g. IBM 360/370 ☒ 4

**Machines:** Please specify model. **Applications**

IBM 360/370 ☐ Commercial ☐

IBM others (specify) ☐ Financial ☐

ICL 1900/2900 ☐ Payroll ☐

ICL others (specify) ☐ Production control ☐

Honeywell ☐ Stock control ☐

Univac ☐ Scientific ☐

Burroughs ☐ Realtime ☐

PDP ☐ Software ☐

Other mainframes (specify) ☐ Database ☐

Other mini-computers (specify) ☐ Message switching ☐

Other mini-computers (specify) ☐ Communications ☐

Other mini-computers (specify) ☐ Data transmission ☐

Other mini-computers (specify) ☐ Central process ☐

Other mini-computers (specify) ☐ Teleprocessing ☐

Other mini-computers (specify) ☐ MIS/CPA/PERT (delete) ☐

Other mini-computers (specify) ☐ Magnetic tape ☐

Other mini-computers (specify) ☐ Disk ☐

Other mini-computers (specify) ☐ Others (specify) ☐

**Job Titles**

Project leader ☐

Systems analyst ☐

Systems engineer ☐

Analyst/programmer ☐

Systems programmer ☐

Programmer ☐

Operations supervisor ☐

Operator ☐

Consultant ☐

Sales representative ☐

Others (specify) ☐

### Position sought

Please state briefly the type of appointment you are seeking.

\_\_\_\_\_

Minimum salary £ \_\_\_\_\_ Notice required/Date available \_\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_

Cut out the whole advertisement and post to one of the addresses below.

**01-4914706**

24-hour answer phone.

Knight Computer Services Limited, 14 Old Park Lane, London W1Y 4NL.



**021-772 8331**

Midlands Recruitment.

Knight Computer Services Limited, Woodlands Road, Birmingham B8 3BD.

**Knight Computer Services Limited**

Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

## Top Vacancies



## Top Vacancies

### CONSULTING SERVICES SALESMEN (Timesharing & Turnkey Systems Incorporated)

With further large scale expansion planned throughout 1978, the group urgently needs experienced top level salesmen to help penetrate existing large volume consulting/turnkey systems and timesharing markets. EMS at present have a product range unmatched throughout the entire UK market, offering scope of penetration in at least 5 major DP user problem areas, ensuring constant work availability.

Ideally, candidates will be capable of functioning as Business Analysts, able to rapidly identify client problems, define services available and to collate and present appropriate reports at Board level. Equally, preference will be given for senior salesmen able to effectively present lecture topics at varying UK and European seminars and marketing demonstrations of new equipment services such as turnkey systems.

Ability to project accurately time scales for systems and programming projects will be beneficial, as would knowledge of how to define configurations required with turnkey systems or to assist with hardware evaluation and package evaluation.

Excellent opportunities exist for leading salesmen to acquire a managerial role if required, within individual sectors of the group. Candidates must be employed in a similar capacity in the UK and accustomed to producing Consulting Services, minimum value £20,000 p.a. Hardware business minimum value £400,000 or a turnkey systems value to be discussed. A dedicated company commitment will be judged as important for future employment within the group.

Consultant: John Wood.

### PROGRAMMERS COBOL/ASSEMBLER/PL1 IBM/HONEYWELL/ICL ETC. LONDON & HOME COUNTIES £3,500 to £6,000

EMS at present have hundreds of Southern clients desperately seeking programming support staff to work on a wide variety of projects including sales ledger systems, accounting ledgers, payroll, stock control, production control, Management Information Systems, Database Development, Networking, etc. Most installations currently use EMS recruitment facilities to assist both to maintain and increase manning levels within the company. Each day up to 50 vacancies are forwarded by post or telephone from the Southern Home Counties. Clients include Banks, Bureau, Consultants, Distributors, Engineers, Manufacturers and Computer Manufacturers, Insurance Companies, etc. Each candidate must return to EMS is processed within 24 hours and in the hands of relevant clients within 48 hours. EMS candidates are generally attending a series of interviews within a week of applying to us. We urgently need your profile also to help ensure the needs of clients achieve recruitment stability. Salaries are attractively geared nowadays at most installations for motivated and conscientious staff. Telephone today for our application form.

Consultant: Solina Mills/Carol Proudman/Don Walklate.

### PROGRAMMERS — COBOL/PL1 — MIDLANDS £3,500 to £5,000

At present, we are submerged with the sheer quantity of outstanding vacancies from clients desperately seeking to attract additional staff to assist with key development programmes. Both PL1 and COBOL programmers are in very high demand. Literally up to dozens of vacancies are available for each applicant we receive, depending upon staff with between 1 and 5 years' practical DP experience, as well as opportunities to move from programming to an Analyst/Programmer career path if desired. Installations vary on a wide scale from commercial to industrial embracing all industries and services. EMS are currently placing up to 20 programmers alone in the Midlands each week, and could be placing 200 with more significant advertising response. Telephone today for an application form and we will get your career development moving for you.

Consultant: Solina Mills/Carol Proudman/Don Walklate.

### ANALYSTS & ANALYST/PROGRAMMERS — UK TO £6,000

Each week over 500 vacancies for Analysts are available with EMS throughout the entire UK, in every major city and town in the country. Extensive national networking by our teams results in new job opportunities rapidly being identified for new candidates within 48 hours of receipt of your application form. Every profile is cross checked against thousands of vacancies held on the EMS computer, enabling us to provide you with a choice many times greater than available elsewhere. High level career paths exist for Analysts experienced in CICS Database (IMS), Networking Systems, Distribution Systems, Production Control and Planning, Accounts ledgers systems and Sales Order Processing. Analysts completing an EMS profile this week will be attending interviews within 7 days on average. Performance Apply to EMS today — we got results, a salary increase for you, new interesting career prospects, and it doesn't cost you a penny.

Consultant: Neil Bradley/A. Tyler/Don Walklate.

### ANALYSTS — HERTS TO £6,000

We urgently require experienced Analysts for a major distribution group involved in extensive systems conversion and enhancement. Extensive knowledge of applications procedures and development in Accounting/Sales Order Processing, Stock Recording/Control, Merchandising and M.I.S. Large quantities of staff are required from Junior Analyst to Team Leader level. Assistance will be given with relocation where appropriate. The company is located in attractive rural surroundings within the Herts area and offers excellent career development prospects.

Consultant: John Wood.

### OPERATORS — LONDON & H. COUNTIES TO £5,000

Numerous vacancies are available each week with a wide variety of clients seeking additional support staff to assist with developing installations. Single and multi-shift systems exist with appropriate premiums being paid for shift working. Clients vary between IBM, ICL, Honeywell and Univac and more equally early shift leader/shift manager prospects are available with expanding installations. Knowledge of JCL is highly sought by IBM installations, as is GEORGE II and III on NEW RANGE by ICL. Honeywell and Univac installations. Apply to EMS for an application form today and get real career prospects — and a rise!

Consultant: Solina Mills.

### CONTRACT REQUIREMENTS

SOUTH	MIDLANDS & NORTH
Analyst/Chain Stores — London	Analyst — Distribution North West
Honeywell Prog. COBOL, TDS, IDS	Analyst — Production Planning North West
ICL COBOL/PLAN various London	Analyst — Package Design — Midlands
IMS Analysts & Programmers	Programmer Honeywell COBOL Midlands/North West
FORTRAN, ALGOL Progs — Surrey/Berks	Prog Honeywell EASYCODER Midlands
Analyst — Package Development — Berks	Prog Honeywell COBOL Birmingham
	Prog IBM ASSEMBLER/CICS — Staffs
	Prog Honeywell TDS COBOL Midlands
	Prog Honeywell COBOL Scotland
	Prog IBM — IMS & COBOL Manchester
	Prog IMS/Hewlett Packard North West



Consultants Ltd.

61/63 Lower Street  
Newcastle-under-Lyme  
Staffs. ST5 2RS  
Telephone: 0782-623665 (10 lines)

Tricorn House  
5 Ways Nr. Aston  
Birmingham

## Att DP Managers

EMS maintain the most comprehensive databank of Recruitment and Contract Analyst/Programmer/Operator files in the UK. For Recruitment or Contract Support — contact EMS for nationwide service. We offer Speed, Low Costs and — Results!

## HERTFORDSHIRE SENIOR SYSTEMS CONSULTANT

**IDENTIFY AND CREATE**  
**Salary - Bonus up to £9,000 + car**

Our Clients are seeking a Computer Professional — the link between their highly successful range of computer systems and the real problems of the technical and commercial user. They see the interpretation of these problems and the identification of creative solutions being an exceptional challenge and career opportunity.

Successful candidates should ideally possess:

- \* a background related to project management in a pre-post sales function.
- \* the ability to co-ordinate the Company's technical and management resources in making sales proposals.
- \* the self-motivation, effective communication, and presentation necessary when dealing with senior client management.
- \* some knowledge of distributed processing or database systems.

Financial rewards are first-class. At the same time, you can expect your role to be enhanced by the creative support of the software and application teams.

CONTACT: DAVE SCARLETT on 01-935 0671

REF. CW/11/22

### SPECIALIST COMPUTER RECRUITMENT LTD.

**BIRMINGHAM 021-236 3781 FREEPOST**

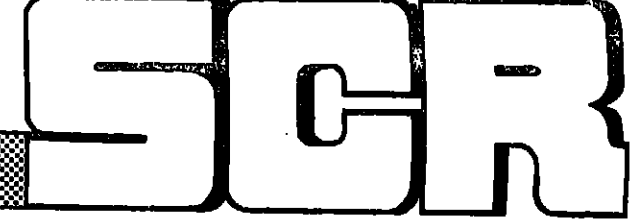
Freeport, Equiry and Law House, 35-37 Great Charles Street, Birmingham B3 2BR

**MANCHESTER 061-833 0676 FREEPOST**

Freeport, Com Exchange Buildings, Corporation Street, Manchester M4 8BD

**LONDON 01-935 0671 FREEPOST 6**

Freeport 6, 102 Blandford Street, London W1E 1JZ



### Wanted by an International Bank System Analyst/ Programmer

having thorough knowledge of Middle East Banking practices and fluent in oriental languages. Five years' experience of On-Line Systems is essential.

Box 1911  
Computer Weekly

## PROGRAMMERS in RPG II and/or Assembler for ABERDEEN COMPUTER BUREAU

Phone or write

CLAYMORE MANAGEMENT

72 Carden Place, Aberdeen (0224) 28399

## Australia Two Systems Analysts AS \$13,000-15,000

Olympic Consolidated Industries Ltd. is an Australian-owned tyre, cable and general rubber products group based in Melbourne, with over 5,000 employees and turnover in excess of AS150 million. In March 1978, the Company will be installing an ICL 2960 to replace current ICL 1900 equipment and it is intended to develop an extensive database to service manufacturing and commercial applications.

We are seeking one Analyst to assist both current staff and an ICL consultant in the conversion to IDMS of an existing NIMMS/DMS2 database for manufacturing applications. When this project is completed, the Analyst would then assume the major responsibility in the development of one of a number of new systems proposed in the areas of production scheduling and recording, costing and budgeting, and inventory control.

A second Analyst is being sought to work with current staff in the redesign of existing commercial applications and the integration of these with manufacturing applications in a company-wide database.

Applicants should be graduates with at least three years of appropriate experience. Salary will be negotiated based on qualifications and experience, but a range of AS13,000-15,000 (£8000-£9500) can be taken as a guide.

Interviews will be conducted in London on 1st and 2nd December by an Olympic representative from Australia.

Please phone 01-788 7772 and ask for extension 2034 or write without delay, enclosing full details of experience to date, to: Caroline Hudson, ICL, Bridge House North, Putney, London SW6 3JX, quoting reference CW1597.



# MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

## PROGRAMMERS up to £6½K GREATER LONDON

Providing good people to top companies has been the policy for this Buckinghamshire software house. The increasing demands for their high quality work have given rise to a need for more people but only the right people. Who are the right people? Well in this instance it is experienced commercial, mainframe programmers. They must have the necessary motivation and responsibility to work on customer premises, ensuring that systems are installed on time and without error.

Ideally they require programmers experienced on IBM equipment and conversant in COBOL, ASSEMBLER, or PL1. However, retraining will be given to other applicants. As the work is spread throughout the Greater London area it is essential that applicants are mobile, preferably possessing their own car. The demands of this job are more than met by the rewards, a high salary, travelling expenses, profit share and regular social activities to ensure that everyone has a good time.

Ref. CW620

## SYSTEMS PROG to £4½K BRENTFORD

This is an excellent opportunity for a programmer with 1-2 years' experience of Assembler and possibly PL/1 to join a lively systems programming team. The vacancy has arisen through a rapid expansion in the use of data processing facilities which are based on a multi-processing 370/168 complex. The team is responsible for supporting the manufacturers software, which includes IBM's most advanced operating system, a TP network running under CICS and a time sharing service. Initially you will be working in one of the areas mentioned, but you will have an opportunity to gain experience in all areas. Training will be provided where necessary. Our client is a UK owned multi-national company manufacturing a wide range of consumer products. If you are looking for good career prospects using the most modern and sophisticated equipment in a very friendly atmosphere, this position is ideal.

Ref. CW624

## SUPPORT ANALYST £5½K LONDON & THE NORTH + Car + Bonus

A manufacturer's success depends on its products and its people. Our client, an international mini computer manufacturer offer the most wide ranging compatible product line available from any company today. Their processors range from micros to powerful medium sized computers. These are backed by a vast selection of peripherals, and of prime importance, a comprehensive range of software. The people they require are support analysts to work in a pre-sales role. This is not a desk job. Most of the time will be spent working alongside the salesforce to provide their customers with necessary software expertise and systems advice. Demonstrations, benchmark programming and design are all part of the job. An in-depth knowledge of mini computer system software, operating systems and applications is essential, also programming ability in ASSEMBLER and COBOL and/or FORTRAN. Special systems experience in communications or database techniques would be advantageous. As well as positions based in W. London this company also seeks staff in Birmingham and Manchester.

Ref. CW626

## SENIOR PROGS to £5K WEMBLEY

Our client, an engineering company whose name is known and respected throughout the world, require experienced programmers. These vacancies are ideal for those people who have a good knowledge of COBOL and want to progress into a position of responsibility. Experience on IBM 370 equipment under DOS/VS would be preferable, but not essential. You would be assisting the Chief Programmer and a Systems Analyst in planning, writing and testing programs on both industrial and commercial applications. These include production control, order processing, stock accounting, ledgers and payroll. As the programming staff work as a team to cover all projects and have a close working relationship with the systems analysts, the work is both varied and interesting. Career progression into the systems area is actively encouraged. The company provides a subsidised canteen and an active sports and social club operates nearby. That, coupled with extremely pleasant, modern office accommodation, makes this a very worthwhile opportunity.

Ref. CW621

## AN INVITATION WITH A DIFFERENCE

Are you looking for a new job? Do you seek change but not a move? Look no further the solution could well be on your doorstep.

We are currently working on behalf of several top companies in N.W. London. They comprise manufacturers, software houses, bureaux etc. users. Between them they seek programmers, analysts, support staff, lecturers and consultants. Some indication of the standard and variety of vacancy may be seen on this page. In order to make it easier for you to discuss these and other vacancies in your area we are coming your way next Wednesday. Drop in and see us during the day or on your way home. Let us find you a new job for the New Year.

## WE ARE COMING TO SEE YOU! MEET OUR CONSULTANTS

at the LONDON EUROCREST HOTEL

next to the Wembley conference centre

on WEDNESDAY, 30th NOVEMBER  
any time between 12 NOON and 9 PM

If this is not convenient then 'phone Rowland Middleton or Pam Quinlan on 637 9611, quoting job reference number

## SENIOR PROG to £5½K LONDON N.W.10

This senior position would be suitable to someone with very good COBOL experience. As you may be required to supervise a team of less experienced programmers, you should be able to show experience or ability in this area. You will be responsible for program design and specifications and will also be expected to communicate with users. The company, one of the largest food groups in Britain, operate extensive real-time on-line systems, linking their warehouses, factories and distribution depots with the central computer. They have just completed the design of the first part of a stock accounting and control system which they are going to integrate into their existing order processing and ledger accounting systems. You would be involved with programming this new system and assisting in its development for the future. Career progression is encouraged and regular training courses are arranged to provide the necessary skills. The company also has vacancies at a programmer level.

Ref. CW627

## SYSTEMS ANALS to £6½K BRENTFORD

Suitable candidates for these very attractive positions should have a background of at least 3 years' in-depth commercial systems and 2 years' COBOL programming and will probably be graduates. Our client is a major international company involved with the design, engineering and construction of, among others, petrochemical processing plants. The size of the company's operations is reflected in the size of the computer systems being developed. Successful candidates will be responsible for developing part of a project cost management system, including detailed discussions with various users, and will be leading a team of around 5 people. A limited amount of travel between company locations, possibly abroad, is to be expected. Completion of this system in mid 1979 will bring about the integration of all the company's financial systems and provide management with a more accurate means of costing and budgeting a project. Database systems will be developed in the future, so career prospects are excellent. Opportunities also exist for analysts/programmers and programmers on this system.

Ref. CW628

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

# SPOTLIGHT ON N.W. LONDON

## ANALYST PROGS £5-9K MIDDLESEX

Our client has style, company style. Its unique way of operating has helped it to become the largest independent computer service company in Western Europe. It is wholly owned by its employees each person being directly responsible for its sales success and as far as possible acting as their own boss, while at the same time, being part of an enthusiastic and extremely sociable young team. Due to the continually increasing workload they require analysts and programmers with commercial, accounting or financial systems experience. It is essential that applicants have had responsibility for the installation of at least one system. Programming experience may be in either high or low level languages; COBOL or Assembler are preferred. The considerable customer liaison involved in this job demands a business-like appearance and attitude. Most of the work is local and thus development done in-house, nevertheless applicants should be mobile. High salaries, top working conditions and every opportunity for promotion are given in return for hard work and enthusiasm.

Ref. CW622

## LECTURER £5K HERTS

The chance to set up and run an entirely new training department is offered by our client, a small but thriving mini computer manufacturer. They offer a wide range of courses including Assembler level programming, operator training and computer appreciation at manager level. These are given to both customers and staff at the company's brand new premises, just 15 minutes by train from central London. The successful candidate will handle the entire training function, booking in the courses, arranging accommodation, designing and preparing new courses material, presenting the courses and writing course reports.

This is extremely rewarding and stimulating work involving a high degree of personal contact at all levels as well as considerable responsibility. It is essential that candidates have a background in programming and ideally have had lecturing experience. Above all they must have the right personality and attitude — outgoing, able to easily communicate ideas and hard working.

Ref. CW623

## SALES SUPPORT £5½K + Car

## HARROW

Simplicity of operation, has proved a successful concept for our client, the first international company to develop and manufacture a purpose built Key to Disc System. They have maintained this concept with their new micro processor based, multi user, distributed processing system, which for ultimate ease is user programmable in ANSI COBOL. To support their busy sales force they require outgoing presentable young persons who would enjoy the demands of working in a fast moving environment. There is continual customer involvement both in pre and post sales support. You will need the necessary experience to undertake systems analysis proposals, demonstrations as well as customer training both in house and on site. The systems installed are all commercial and written in COBOL, a comparable background is essential. This is a great opportunity to put your programming and systems skills to good use while furthering your career in the more stimulating, varied and rewarding support environment.

Ref. CW625

## SOFTWARE PROG £5½K ACTON

If you have a thorough knowledge of IBM Assembler and are looking for the opportunity to work on software, this position would be of great interest to you. You will be working with the systems programmer on a variety of interesting software packages including an on-line program development system, an expanding TP network, a DOS/VS operating system and future development of a database system. Experience of these sophisticated systems is not necessary as training will be provided. Suitable candidates would be mature, responsible people who have probably reached a senior programmer level.

Our client, who organise and manage community resources, offer job security, steady career prospects and an attractive range of fringe benefits. These include 5 weeks' holiday, flexible working hours, and interest free season ticket loans. They will also provide 100% removal expenses, pay legal fees up to £300 and in suitable cases, lodging allowance.

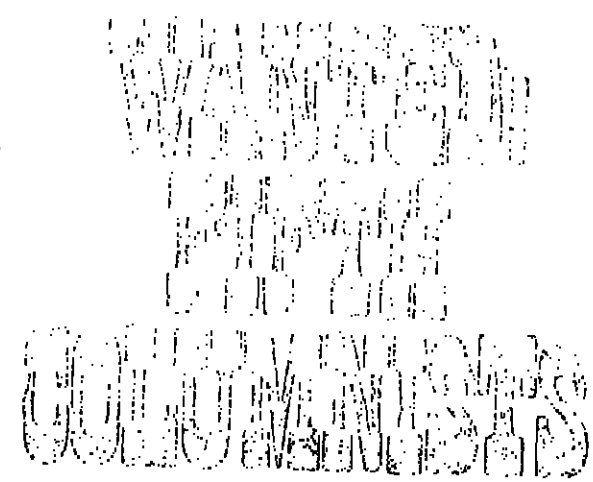
Interesting work together with attractive fringe benefits make this an excellent opportunity.

Ref. CW629

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION





A lot of people reading this advertisement will be able to tick one or more boxes in the first four columns. The fifth is the problem. If you can tick one or more in the first four and one or more in the fifth we can virtually guarantee that our client would like to interview you. Equally important, we think you would like to interview him.

<b>1</b> Have you held positions as	<b>2</b> Are you currently earning circa	<b>3</b> Have you had experience with	<b>4</b> Are you interested in	<b>5</b> Are you capable of working on
<input type="checkbox"/> Systems Analyst	<input type="checkbox"/> £3,000	<input type="checkbox"/> CORAL	<input type="checkbox"/> An excellent relocation package	<input type="checkbox"/> Data Transmitters
<input type="checkbox"/> Software Engineer	<input type="checkbox"/> £3,250	<input type="checkbox"/> ASSEMBLER	<input type="checkbox"/> Golf	<input type="checkbox"/> Digital Switching
<input type="checkbox"/> Programmer	<input type="checkbox"/> £3,500	<input type="checkbox"/> Low Level Languages	<input type="checkbox"/> More money	<input type="checkbox"/> Systems/Software
<input type="checkbox"/> Group Leader	<input type="checkbox"/> £3,750	<input type="checkbox"/> Real Time Systems	<input type="checkbox"/> Surfing/Skin Diving	<input type="checkbox"/> Diagnostic Software
<input type="checkbox"/> DI Manager	<input type="checkbox"/> £4,000	<input type="checkbox"/> 4040	<input type="checkbox"/> Living in the warmest part of the UK	<input type="checkbox"/> Device Handlers
<input type="checkbox"/> Applications Engineer	<input type="checkbox"/> £4,250	<input type="checkbox"/> 8080	<input type="checkbox"/> Sailing	<input type="checkbox"/> Logic Circuit Design
<input type="checkbox"/> Computer Maintenance Engineer	<input type="checkbox"/> £4,500	<input type="checkbox"/> PDP11	<input type="checkbox"/> Housing at reasonable prices	<input type="checkbox"/> Microprocessor applications
<input type="checkbox"/> Test Engineer	<input type="checkbox"/> £5,000	<input type="checkbox"/> DEC	<input type="checkbox"/> Fishing	<input type="checkbox"/> Telecommunications
<input type="checkbox"/> Circuit Designer	<input type="checkbox"/> £5,500	<input type="checkbox"/> P1250	<input type="checkbox"/> A variety of opportunities	<input type="checkbox"/> Analogue/Digital Systems

We realise that we have used some cliché words/phrases like "opportunities" and "housing at reasonable prices," which appear in a lot of other ads. But they happen to be accurate.

The opportunities exist at graduate, assistant, senior, principal and chief engineer levels over wide fields of activity involving commercial or defence applications.

The location is the coast in the West Country.

If you have read this far, it should be worth the time - and the price of the phone call - to speak to John Nolan on 01-638 1891. He will give you all the extra information you need and will make sure that if you are interested you aren't kept hanging about for weeks.

**Richard Owen Advertising**

56 Morningside, London, EC2

## SYSTEMS ANALYSTS

A Vital Role in Telecommunications

The Management Services Division of Cable & Wireless is engaged in the development of systems used to support our international telecommunications activities. We are planning a number of major projects involving the use of mini- and micro-computers, database techniques and distributed processing. We need experienced Systems Analysts to work with teams of programmers on these projects. You must be prepared to undertake some foreign travel, mainly to the Middle East.

Sound experience in all aspects of systems analysis and design is essential; good business sense coupled with a strong personality is important.

These appointments represent opportunities to build successful and rewarding careers with us. Commencing salaries will be at least £5,000. In addition, a wide range of benefits, including foreign travel allowances, are applicable.

To discuss these appointments, ring Howard Yates on 01-242 4433 extension 4595. If you prefer, write with brief career details to:

Recruitment Manager,  
Cable & Wireless Limited,  
Dept. A584(a)/782,  
Mercury House, Theobalds Road,  
London WC1X 8RX.

The Cable and Wireless Group - comprising over 40 companies operating in 70 countries - is the world's largest international organisation supplying telecommunications services and facilities. Systems and services embrace space, radio, cable, telephone and specialised networks; broadcasting and television, telephony, telegraphy, telex, facsimile and data.

**Cable & Wireless**  
Leaders in International Telecommunications



## MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

### PERFORMANCE MEASUREMENT

NEAR READING

£6000-£8500

A key department within our client's organisation comprises an elite team specialising in Performance Measurement and the Comparative Evaluation of various hardware and software products offered by major manufacturers.

The department is presently being expanded and a number of additional staff are required who have experience in carrying out benchmarking exercises using hardware monitors and other sophisticated techniques. In addition to organising system performance trials the positions call for a high degree of individual flair and initiative in reacting to findings to ensure optimum results are achieved in comparative situations.

Whilst candidates should bring expertise in any area of hardware or software performance measurement, specialist knowledge in any one of the following would be of particular interest:-

- ICL 1900/2900 under GEORGE/Systems B or K
- Univac 1100 under EXEC-8
- Honeywell Series 60/64-60/66
- Burroughs B700/800 series

The successful candidates will have the opportunity of broadening their horizons to a wide range of products and keeping abreast with the latest hardware and software available.

The Company has substantial interests throughout the world and provides its employees with extremely good conditions of employment and considerable scope for career advancement.

Please telephone for a confidential discussion or write to:

30 Fleet Street London EC4Y 1AA  
01-353 588

Expanding travel/hotel group in pleasant seaside location near Folkestone is strengthening its computer department and requires the following personnel:

### D.P. MANAGER c. £6,000 + CAR PREFERRED AGE 30 +

The ideal candidate will have at least several years' experience as D.P. Manager and some experience using system 3. Our hardware is 96K system 3 model 12 on 3270's. In-depth knowledge of C.C.P. is essential, as is experience in liaison with departments. The successful candidate will report directly to the Managing Director and is responsible both for day-to-day running of the computer department and its future development.

### SYSTEMS ANALYST c. £5,000

Having several years' experience of system 3, the successful applicant will report to the D.P. Manager.

Both positions offer attractive working conditions, help towards relocation expenses and other fringe benefits.

Apply in confidence, enclosing C.V. and details of current earnings, to:

**Roger De Haan, Managing Director  
INTER CITY TOURS LTD.  
Enbrook House, Sandgate, Kent**

These positions are open to both male and female applicants

#### WESSEX REGIONAL HEALTH AUTHORITY

#### DATA PREPARATION TEAM LEADER

required for our Computer Centre at Wimbor, Winchester. Applications are invited from suitably qualified and experienced persons to be responsible for the Data Preparation Supervisor for a small team of Key Ed Operators. Candidates should, ideally, be experienced in Key to Disc.

Good working conditions and career opportunities available.  
Salary Scale Supervisor II, £2,820 rising to £3,055 inclusive of supplements.

Job Description and Application Forms available from the Personnel Department, Highcroft, Ransley Road, Winchester, Hampshire, SO9 4TT. 01251-353 477.  
Closing date: 29th November 1977

#### LOWFIELD (STORAGE & DISTRIBUTION) LTD.

#### REAL-TIME PROGRAMMER

Up to £3,750 p.a. Daventry, Northants

Lowfield, a subsidiary of Imperial Foods, provides a nationwide food delivery service based on major warehouse and distribution depots throughout the U.K.

At our Daventry Headquarters we have a large team developing advanced real-time computerised data systems using a distributed network of Data General Computers.

We are now seeking to strengthen this team with a male or female, preferably with two years' job experience on minis.

Please write giving details of age, qualifications, experience, present salary to: Personnel Director, Lowfield (Storage and Distribution) Limited, 4-6 Church Street, Northamptonshire.

## Tired of your good ideas going down the drain? Not as a Systems Analyst with OSMA Plastics

Our client is Wavin Plastics, whose OSMA range of plastic building and drainage products are recognised market leaders. They have asked us to recruit a Systems Analyst for them at a salary of around £5,000 - someone who wants to become involved with the development of On-Line systems.

### PROSPECTS

So many systems jobs don't really lead anywhere at all. This one does, and we can substantiate this by saying that if you have between one and two years' systems experience and you want to move into the development of On-Line systems, then have a look at OSMA Plastics. They are in the forefront of their industry, a stable, growing company utilising the latest computer techniques, constantly satisfying the need of an extremely demanding management, but creating for their own computer staff some exciting technical opportunities.

So what must you offer in return? At least one successful system, be enthusiastic, enjoy your work, be creative and like working with a minimum of supervision.

### LOCATION

Wavin Plastics are based just outside London, not very far from London Airport, an area which is easily commutable to from extremely reasonably priced housing areas, which are also without doubt, some of the nicest areas to live in, in Southern England.

### TO APPLY

Please apply to John Goldsmith by ringing 01-828 5356 during normal office hours, or outside normal office hours on Camberley 21286. Alternatively, please ring John Quenby, DP Manager for Wavin Plastics on Bedford 741220. Ref. 1057.



Computing  
Services  
Association

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER

John Goldsmith (Computer Recruitment) Ltd., 15, Buckingham Palace Road, London, S.W.1.  
Tel: 01-828 5356-24 hour answerphone service.

**JOHN GOLDSMITH** (Computer Recruitment) Ltd.

## JBA

### Senior Consultant

Sales Division Herts

package £9000 + car

A highly successful computer manufacturer is seeking to appoint a senior member for a team which is totally responsible for the company's larger systems sales. Candidates will be able to demonstrate previous experience of project control, probably in a post sales support role; have the ability to identify customer requirements; co-ordinate resources, and to deal positively with clients. Proposal writing and presentations are both considered important aspects, an understanding of Distributed Processing, DBMS applications and experience on large mainframe machines would be a distinct advantage.

Excellent career potential.

Contact Margaret Stevens

### Systems Consultants

London and Home Counties

up to £7250

Our client, one of the largest software houses in Europe, has vacancies for systems staff to work on a variety of projects in the South of England. Applicants must have at least four years' in systems analysis and design and several years in programming. Experience of commercial applications using mainframes and minis would be ideal.

Excellent salaries and opportunities.

Contact Jim Baker

### Chief Programmer (RPG-2)

Central London

circa £8000

A large commodity trading company with an IBM installation seek an experienced RPG 2 programmer looking for a senior post. Duties will be to supervise programming and operations staff, maintain and ensure adherence to standards and liaise closely with Systems Analysts. The likely applicant will probably be between 24 years and 30 years, progressive, self assured and capable of dealing at all levels. Excellent prospects.

Good opportunity for right person to really establish a career path.

Contact Mike Creamer

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

**JAMES BAKER ASSOCIATES**  
International Personnel Consultants  
16 Maddox Street, London W1. Tel: 01-491 4478

### Systems Engineer/Analyst

West of London

neg. circa £6000

Applications are invited from those who can make an immediate contribution in a demanding technical role. In order to qualify for this job it is essential that candidates have experience of commercial or manufacturing applications and be able to demonstrate a thorough knowledge of an Assembler level language. Specialist skills, such as real-time development on minicomputers will be highly valued. This is a chance to work on possibly the most advanced manufacturing control system outside the U.S.A.

An excellent opportunity for the ambitious technician to join a small but highly professional team.

Contact Margaret Stevens

### Minicomputer Programmers

Berkshire

c.£5750

A large and well established British company has outstanding opportunities for programmers to work on the development of sophisticated real-time systems.

Candidates must have at least one year of programming in either Assembler, CORAL or FORTRAN on technical or commercial applications. Experience of real-time projects would obviously be an advantage. These vacancies offer the chance to work with a professional team using new techniques for advanced systems.

Salary according to experience. Generous fringe benefits and relocation assistance.

Contact Jim Baker

### Australia

Approaching summer, very high standard of living, good salaries, and varied unparalleled opportunities must make Australia an attractive prospect at this time. If you are seriously considering a move, contact us for our free counsel and help in locating a good career situation.

Currently in urgent demand: Honeywell 6000 or Level 86 personnel; CICS expert; IBM COBOL Programmers

Contact Mike Creamer



**WEST YORKSHIRE**

**SYSTEMS ANALYST** To £4500 + car  
General commercial systems expertise required. Must have higher educational qualifications. Preference will be given to people with manufacturing systems experience.

**SENIOR ANALYST/PROGRAMMERS** £4300 + Review  
Medium size installation running ICL hardware requires two senior analysts/programmers for commercial applications. Good career prospects.

**ANALYST/PROGRAMMER** to £4400  
This manufacturing company are seeking a well experienced COBOL programmer who has had some systems design experience and would like to further it. High proportion of new development planned.

**PROGRAMMER/ANALYSTS** to £4900 incl. Bonus  
Major software house requires additional staff for new contracts. Medium to small maintenance COBOL experience required. Dedication and effort are rewarded in cash.

**MAINTENANCE PROGRAMMER** to £3900 + Review  
Maintenance and development work in medium installation. Preference for people with some systems knowledge.

**PROGRAMMER** to £4500  
Large installation requires ANS COBOL programmer. Preferably with Data Base experience in a CICS + Batch environment. Excellent opportunity in a growing installation.

These are representative vacancies only. Telephone for further information of these and many more in the north of England.

**QUEENS ROAD MILLS, QUEENS ROAD**  
**HALIFAX HX1 1LR. TELEPHONE: HALIFAX**  
**0422 58232**

**QRH**

**SCHOOL EXAMINATIONS DEPARTMENT**  
**UNIVERSITY OF LONDON**

**PROGRAMMER**

**UP TO £5,261 inclusive**

- \* Salary scale: £2904-£4811 plus £450
- \* Six weeks' annual leave, plus official Bank Holidays and an privilege days
- \* Interest Free Season Ticket Loans
- \* Membership of the Universities' Superannuation Scheme

Applications are invited from programmers with at least eighteen months' experience in PL/I and preferably with a working knowledge of COBOL to join a team of programmers responsible for the processing of the University's GCE Examination in U.K. and Overseas. An ICL 1903T computer is used and processes information stored both on disc and magnetic tape files. Applicants should be familiar with GEORGE operating systems.

Application forms and further particulars from Miss Jane Ritchie, School Examinations Department, University of London, 86/72 Gower Street, London WC1E 6EE. Tel. 01-536 8000 Ext. 80. Closing date for applications is 8th December, 1977.

**EXCESS**

**Computer Operator**

**TIRED OF COMMUTING?**  
**BORED WITH YOUR SURROUNDINGS?**

If your answer to these questions is 'yes' take a look at what Excess can offer . . . you may find you are in for a pleasant change.

Salary circa £3,800 including shift allowance

- Modern offices in delightful surroundings
- Non-contributory pension fund and life assurance
- Lunch vouchers and subsidised canteen
- Mortgage subsidy after a qualifying period of service.

Excellent sports and social facilities where you can meet lots of friendly new people

We are operating an IBM 370/138 and presently developing teleprocessing and data base systems. We need someone with at least six months' experience gained on IBM equipment with knowledge of DQS VS and GRASP/POWER willing to work on a shift basis.

If you are interested please write or telephone:

Irene Northcott, Personnel Officer  
Excess Insurance Group  
The Warren Warren Road Worthing  
West Sussex BN14 9DD  
Telephone Worthing (0903) 39933

**Watch this space for details of the next Square One Open Evening on 5 Dec.**

Come and talk to us over a beer and a sandwich, and discuss worthwhile opportunities in a company where skills and hard work really count.

**150 Regent St, London W1**

**one**

Square One Computer Services Ltd 02405 74161

**SENIOR PROGRAMMER c. £7,500**

**LONDON, S.W.1**

An experienced COBOL programmer ideally with FORTRAN and/or ASSEMBLER, and with in-depth knowledge of the IBM/DOS operating system is required. The ability to manage a small programming team and generate original thought in the areas of systems and programming standards and efficient machine usage, would be advantageous.

**SENIOR SYSTEMS ANALYST c. £6,500**

**SOUTH BUCKS.**

A large manufacturing group with continuing expansion of their data processing activities, requires a senior person to help them move into a multi-programming environment. This vacancy could provide the opportunity for advancement within the group.

**TRAINING OFFICER (OPS) c. £5,000**

**HOUNSLOW**

The position would suit a mature person with communicative skills and good IBM/ICL operating exp. wishing to come off the shift system. If you would like a more responsible position with a sophisticated company, imparting your operator skills and co-ordinating training schemes, please contact us.

Please phone for an application form for the above vacancies or for information about a job to suit you.

**AMES PERSONNEL**  
TELEPHONE: 01-767 0611

**BUSINESS SYSTEMS ANALYST**

**LONDON WEST END**

Mills and Allen International Limited, a large group of companies with interests in poster and cinema advertising, money broking and printing require an analyst to assist the Systems Development Manager in the introduction of new Methods and expansion of existing computerised systems.

The group already uses several bureau facilities to provide its computing power, and plans are being formulated to expand into online enquiry systems within the next year. In addition one of the group companies will be acquiring an in-house computer due to be live in July 1978.

Future development plans are extremely varied, and the successful applicant will be expected to design, formulate and implement the correct computer solutions for the appropriate business requirements.

Qualifications are not rigidly defined for this post, but the successful applicant is not likely to have had less than three years' analysis experience, preferably with a strong commercial background and some knowledge of on-line computing techniques.

A salary in the region of £6500 can be expected with further increments negotiable for applicants with the necessary experience.

For further information write to Chris Ryan, Systems Development Manager, Mills and Allen International Limited, Buchanan House, 24-30, Holborn, London EC1N 2JY, or Mrs. J. G. G. 0403 555.

**Manchester Computer Project Staff**

**Project Managers**

We are seeking two project managers, one to handle industrial process control projects, the other to handle projects involving data communication networks. Our project managers take responsibility for all aspects of a project. Internally they are responsible for co-ordinating resources, managing the engineering and software teams, assigned to the project and meeting the performance specification within the planned time and time scale. Externally they provide the main link between the customer and the company. These are senior appointments. Applicants should have a good scientific or engineering background and substantial experience of real-time computer applications in a relevant, with either a supplier or a large user.

**System Designers/Programmers Project Engineers**

We have vacancies at senior and intermediate levels for a number of system designers, programmers and project engineers to join project teams, handling real-time computer applications.

These are attractive openings for competent professionals who are looking for technical challenge and advancement. Candidates should have at least two years' experience in real-time field and successful applicants are likely to have a degree in computer science, mathematics, physics or engineering.

Successful staff in these categories can expect to progress quickly into senior systems design or project management positions.

**Technical Authors (equipment and software)**

Good technical documentation—design specifications, operating manuals, programming manuals, maintenance manuals—is essential to the success of any advanced computer project. Our technical authors gather information first hand as full members of the engineering and software project teams and are responsible to the Project Manager for writing all the technical literature with a minimum of supervision.

Self-motivation, a logical mind and the ability to write clear concise English are more important than formal qualifications although most of our best authors do have a good academic background. Naturally, experience in computer software or engineering would be an advantage but we are prepared to provide training for candidates from other disciplines who are otherwise suitable.

FERRANTI LIMITED is a wholly British Company. We design and manufacture the ARGUS 700 range of computers and are European market leaders in supplying real-time industrial process control and on-line data communication systems. Being system suppliers as well as equipment manufacturers our staff are able to see project as a whole and the interactions between hardware and software design are within their control. Professional development is encouraged.

Competitive salaries will be offered. Generous relocation allowances are available where appropriate. Our offices and laboratories are in a pleasant part of South Manchester close to very good residential areas.

Apply in the first instance to Mr. W. L. Robinson, Ferranti Limited, Simonsway Wythenshawe, Manchester M22 5LA giving brief career details (quote reference WD15/CW).

**Informal Interviews**

If you would like an informal discussion on career prospects with Ferranti in any branch of computer system design, software, project engineering, sales or customer support, senior members of our staff will be happy to meet you at one of the following times and places:

**LIVERPOOL:** Adelphi Hotel, Tuesday 29th November 4.30 pm to 5.30 pm  
**STOKE-ON-TRENT:** George Hotel, Burslem, Thursday 1st December 4.30 pm to 5.30 pm  
**LONDON:** Charing Cross Hotel, Monday 5th December 4.30 pm to 5.30 pm  
**WATFORD:** Beehive Hotel, Tuesday 6th December 4.30 pm to 5.30 pm

Don't make an appointment just arrive.

**FERRANTI**  
Wythenshawe Division

**We want someone to tell us where to go**

Not literally, of course, but we do need an experienced computer professional to conduct specific research into the application of both hardware and software, including systems and programs produced by Software Houses, Bureau and other agencies, to enable our computer department to expand in the right direction.

As our Senior Systems Programmer you will undertake feasibility studies and produce evaluated reports on the use of programming techniques and software. You will estimate and review the time and costs involved in producing Research Group systems as well as prepare detailed programming specifications and outline the more complex programs and sub-routines.

You will need to be an experienced computer professional with a background in programming in 1900 COBOL, GEORGE 2+ and a proven knowledge of computer systems.

Salary is up to £6797 per annum inclusive. 38-hour, 5-day week with overtime operation.

If you would like the opportunity of telling a computer where to go, please write for an application form to our Personnel Officer, Town Hall, Farnham, London E17 4JF.

Please quote reference S.748. Closing date: 9th December, 1977.

**Waltham**

**Computer Personnel International**

110 St. Martin's Lane, London WC2N 4BH  
Telephone: 01-836 6775

**OPERATORS  
SHIFT LEADERS  
DATA CONTROLLERS**

I have lots of extremely interesting jobs on file for Operations Staff from Trainee Operator to Operations Manager. If you are contemplating a change why not ring me — I may have the perfect job for you.

**STOP PRESS — SENIOR OPERATOR WITH PROSPECTS TO SHIFT LEADER. GOOD IBM DOS EXPERIENCE ESSENTIAL. SALARY TO £5,000 INCLUSIVE.**

**Contact: EVE LUDEMAN**

**SYSTEMS ANALYST  
c £7,000  
CENTRAL LONDON**

Our client, the British office of a major U.S. organisation, using IBM equipment, now wish to appoint a Systems Analyst for their highly professional computer department.

As a skilled member of the computer team, you will be responsible to the Systems and Programming Manager for the analysis, design and implementation of various new applications including on-line systems. You will be a measurable entity in your own right and you will receive training to enable you to progress along a well-defined career path.

Competitive company benefits include, amongst others, free lunches, non-contributory pension scheme and season ticket loan.

**Contact: MARILYN DAVIDSON**

**INTERVIEWS — NEW YORK, USA  
IBM O.S. COBOL  
ANALYST PROGRAMMERS**

One of the most prestigious consulting companies in America has vacancies for several high-calibre Data Processing Professionals, who will be assigned to one of several locations in the USA, including major cities and semi-rural areas. In the States, Analyst Programmers are expected to demonstrate ability in a broad range of skills — user liaison, analysis, program design, coding, testing and documentation. For these vacancies OS COBOL is mandatory; any experience in specialist areas, such as IMS, CICS, PL/1 would be of particular interest to our client. Standards of selection will be very high, but candidates who are short-listed will be flown to New York's Kennedy Airport (at our expense) and taken to our client's office for a final interview. An excellent salary package will be negotiated.

**Contact: LINDA BENSTED**



**Real Time People**



**Computer Room People**

**Computer Room People**

**ASSYST**

**Computer Services Group  
SALARY UP TO £9,000 PER ANNUM**

**ANALYST/PROGRAMMERS**

Experience IBM SYS/3 (and preferably IBM 370) with programming experience of RPG II and COBOL.

Three of these positions are for our office in Al Khobar, Saudi Arabia, where benefits include:

- \* Tax free salary
- \* Free housing
- \* Free Medical and Insurance
- \* Free Transportation
- \* Free air fares to U.K.

The other position is for our Branch Office in Amstelveen, Netherlands.

ASSYST is the leading computer bureau and consultancy group of companies operating in Saudi Arabia and Gulf and has offices in Riyadh, Al Khobar, Dubai and Amstelveen. The company has grown considerably in the past three years and offers a D.P. professional the opportunity to grow with it.

Please send your C.V. (or a brief letter outlining your experience) to:

**Mr. A. Mordain**  
**82 Kingsway**  
**South Shields**  
**Tyne and Wear NE33 3NJ**

or telephone 0632 588273 after December 1st

**MINI COMPUTER SALESMEN**

**EAST AND WEST MIDLANDS  
BASE SALARY c. £5K p.a. QUOTA EARNINGS  
c. £10.5K 2 LITRE CAR + EXPENSES.**

Our client is a well-established international mini computer manufacturer, selling a range of disc based mini computers.

The company offers sizeable sales territories, an excellent product in hardware and application package terms, and good technical support resources against a background of a realistic sales quota.

Candidates should have a proven sales record within the mini computer/VRC sales field, coupled with a sound business systems understanding, and should reside in the Midlands. Prospects for future career development are excellent for self starters.

Company benefits include pension scheme, permanent health insurance, luncheon vouchers, etc.

**CONTACT: DALE HADLEY on 021-236 3781**

**REF. NO CW/11/24**

**SPECIALIST COMPUTER RECRUITMENT LTD**

**BIRMINGHAM 021-236 3781 FREEPOST**  
Freeport, Equity and Law House, 35-37 Great Charles Street, Queenway, Birmingham B3 2BR

**MANCHESTER 061-433 0476 FREEPOST**  
Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

**LONDON 01-535 0471 FREEPOST 6**  
Freeport 6, 102 Blandford Street, London W1E 1JZ

**CR**



# Systems Programming—Europe & U.K.

These positions for men or women are within the recently created Switching New Products Division of STC and are based at locations in North London and Antwerp. The division is actively engaged in developing a number of processor-based products that control and augment the telephone switching network.

If you have at least 3 years experience in a professional programming environment, preferably real-time, then we would like to talk to you. We can offer the opportunity for your career to grow with a well supported and rapidly expanding division.

Salaries are attractive and reflect the importance of these growth areas of telecommunications. Generous relocation expenses are available and the Antwerp assignments, which are for one to two years, include an extensive range of additional benefits.

Present vacancies are at Team Leader and Programmer levels in three project areas:

## • SPC Telephone Systems: Antwerp then London

All aspects of telephone exchange software, including environment simulation, man-machine interaction and customer application engineering.

## • Network Administration: London

Design and development of systems software in centralized on-line supervisory centres for SPC exchanges.

## • Operator Systems: London with overseas travel

Specification and high level language programming for an add-on microprocessor network that supports telephone operators.



**Switching  
New Products  
Division**

**Standard Telephones and Cables Limited**  
A British Company of I.T.T.

For further details please phone David Leavers on 01-368 1234, Ext. 2661 or write quoting ref SNP 22, to:  
Tom Kerr, Standard Telephones and Cables Ltd.,  
Oakleigh Road South, London N11 1HB.

**COMPUTER  
ENGINEERS  
U.K. — 0.8.**  
Field/Service  
All systems  
£4,000-10,000  
stand by  
shift  
overseas  
according to post  
car or allowance  
E. R. STACK ASSOCIATES  
Recruitment Consultants  
Huddersfield (0484) 4175

**THE UNIVERSITY  
OF LEEDS**  
**DEPARTMENT OF  
MECHANICAL  
ENGINEERING**

Applications are invited for the post of **RESEARCH OFFICER** in the new research project in the area of mechanical engineering. The successful candidate will be responsible for the development of a research project in the area of mechanical engineering. The post is full-time and requires a minimum of a B.Sc. (Hons) in Mechanical Engineering. The salary is £3,500 per annum. Applications should be sent to the Director of the Department of Mechanical Engineering, The University of Leeds, Leeds LS2 9JT.

## DEVELOPMENT EXECUTIVE INFORMATION RETRIEVAL

c. £8,000

Thomson Data Ltd. and its member companies, which supply computerised services of a technical nature throughout the world, wish to broaden their activities in the field of information retrieval.

They wish to appoint a Development Executive to assist in further expanding their field of operations, particularly through acquisition. The successful candidate will be responsible to the Managing Director of Thomson Data Ltd. and the duties will include the development of policy and the evaluation of ideas which will lead to further investment in the information retrieval field.

Candidates should be experienced in the commercial application of computerised information retrieval techniques and be able to bring to bear a business like attitude to the development of such operations. The successful candidate, who is likely to be aged 30-40, will have the necessary energy and drive to make progress in this key position.

Please write, with abridged curriculum vitae, to: **Managing Director, Thomson Data Ltd., c/o Derwent Publications Ltd., Rochdale House, 128 Theobalds Road, London, WC1X 8RP.**

## Sales Executives in North and Midlands circa £10,000+car

### MESSAGE SWITCHING SYSTEMS

The CASE Message Switching System meets the needs of large telex users by providing store and forward message transmission and automated dialling. On many systems VDUs with text editing facilities are used in place of teleprinters to prepare and transmit telex messages.

Additional Sales Executives are required in the North and Midlands to build upon the CASE success in Message Switching. Knowledge of mini-computers, data transmission or data terminals is minimum requirement.

Please write or telephone:  
Michael Hafferty — Northern Sales Manager — Bradford 32378.

We pay top rates for the right people.

CASE is a young energetic company specialising in the manufacture of data communications systems. The company's products include multiplexers, concentrators, modems and message switching systems. Continuing expansion provides an opportunity to join an enthusiastic informal group in a job where salaries, conditions of service and career opportunities are excellent.

**Make contact with CASE**



COMPUTER AND SYSTEMS ENGINEERING  
Ground Floor, 2nd Floor, 3rd Floor, 4th Floor  
Derwent Publications Ltd.  
Telephone: 01-253 1234

## New Sales Support & Sales Opportunities — UK

A major international computer manufacturer is announcing in Europe an exciting range of small computers in the New Year. They therefore immediately require Branch Managers, Systems Analysts, Salesmen and Technical Support Personnel as well as a UK Training Officer. Previous experience should be with RPLI type computers or mini computers using commercial skills with a professional approach to problem solving. Personnel will have a marvellous opportunity to get in on the ground floor where salaries will be very competitive. Vacancies exist in W. LONDON, BIRMINGHAM, MANCHESTER and LEEDS. CW 47/9, Michael.

### OPERATOR City To £4,500

If you have experience on any medium-sized system then this BURROUGHS 4700 user could be interested. 12-hour shifts. Nice perks. CW 47/10 Patricia.

### SENIOR OPERATOR W. London £3,750

A major chain store offering 10% bonus, N.C.P.s and discount shopping requires an ICL experienced operator with supervisory experience. CW 47/11 Patricia.

### SENIOR OPERATOR Bedfordshire £5,000 + 0/T

A major user having an advanced IBM OS/VS1 system using T/P requires operators who really know their business. CW 47/12 Patricia.



**DATA EXPRESS HOUSE**  
PROSPECT PLACE  
HEATHFIELD TERRACE  
CHISWICK W4 3BR  
Recruitment Consultants

01-995 3883 or  
01-958 6138 evenings

### PROGRAMMERS Hemel Hempstead c. £5,000

Are there any of you who have commercial FORTRAN? Good, then this multinational firm in Herts with top perks including free lunches and non-C.R.S. is looking for you! Unvac experience would be ideal but other machines acceptable. CW 47/13 Annette.

### SENIOR PROGRAMMER N.W. London £5,500

You must have 2 years' IBM ASSEMBLER or PL/I and interested in working for an insurance company with new projects. Company attractions include Flexitime, 3 weeks' holidays, subsidised canteen and mortgage assistance plus an excellent social club. CW 47/14 Annette.

### PROGRAMMERS & SENIOR PROGRAMMER South Coast £5,500

This finance organisation situated in a lovely part of the coast (New Brighton), has a major IBM OS installation and requires two people with COBOL experience (ASSEMBLER knowledge would be nice). Rates include C.P.S., L.V.s plus mortgage and relocation assistance. CW 47/15 Annette.

### SYSTEMS ANALYST Ilford c. £6,000

An involved Consumer manufacturer with a large Manpower 8000 installation requires an analyst with good business systems experience. Programming experience is NOT essential. Good prospects for promotion. CW 47/16 Annette.

### SENIOR PROGRAMMER SW1 to £7,500

A very successful commercial service bureau, having an IBM DOS computer, needs an experienced COBOL programmer with more than the average ability. Must enjoy meeting and advising clients L.V.s, C.P.S. etc. CW 47/17 Annette.

## SOUTH STAFFORDSHIRE PROGRAMMERS AND SENIOR PROGRAMMERS

**GET IN THE RIGHT SPIRIT FOR CHRISTMAS WITH  
"PROJECT DEVELOPMENT" I**

Due to continued expansion of their Computer Services Department, our clients, a major company in the leisure industry, are seeking computer professionals to augment their existing team. They are utilising latest computing techniques and excellent opportunities are available for successful candidates to gain valuable experience in a developing commercial environment.

Openings available are:  
**SENIOR PROGRAMMERS** Salary c. £4,800  
**PROGRAMMERS** Salary c. £4,100

Ideally applicants should have:  
★ 2-3 years' programming experience.  
★ Fluency in COBOL. ★ Supervisory ability.

The company offer excellent benefits including: pension and life assurance schemes, subsidised lunches, sports and social facilities, etc. Contribution towards relocation expenses is available where appropriate. For further details, please contact:  
ROD BEESON, on 021-236 3781

REF. NO. 77/11/23

**SPECIALIST COMPUTER RECRUITMENT LTD.**  
**BIRMINGHAM** 021-236 3781 **FREEPOST**  
Freeport, Equary and Law House, 35-37 Great Charles Street, Queenway, Birmingham B3 2BR

**MANCHESTER** 061-833 0676 **FREEPOST**  
Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD  
**LONDON** 01-935 0671 **FREEPOST** 6  
Freeport 6, 102, Blandford Street, London W1E 1JZ



**SCR**

## ARE YOU A SUPER PROGRAMMER?

The demand for first-class programming staff has never been so high. Listed below is a short list.

**RPGII** people to work for an exceptionally friendly Consultancy operation based in SURREY. Candidates must be prepared to travel and generally "muck-in" £6,500 + expenses.

**FORTAN** people with Real time experience on any mini computer for scientific work on the SOUTH COAST.

**COBOL DOS** Expert to manage a small programming team, set up systems and programming standards, etc., for Service Company in SW1 £7,500.

**ICL COBOL** Junior with six months experience for Financial concern in EC4. Excellent training and prospects £3,000 + Opportunities also exist for JUNIOR ANALYSTS or ANALYST/PROGRAMMERS wishing to progress into pure systems work. Salaries c.£4,500.

**FLIGHT SIMULATION EXPERT FOR THE USA.** If you have a minimum of 3 years' experience in design and programming on engine simulation and flight systems with a solid grounding in PDP 11/45 ASSEMBLER, then this is your chance to see a bit of the world at someone else's expense. You will be based in the States for at least 6 months, with all expenses paid and a flat provided, after which, there will be an excellent position available in the UK should you desire. £7,000 neg.

Similar posts available in the UK. Salaries to £7,000 neg.  
**PROGRAMMING CONSULTANTS** A major Computer Services Company located on the BUCKS/HERTS BORDER has an urgent requirement for professional Programming Consultants with the following experience:

MINI COMPUTER SOFTWARE with compiler writing experience  
MINI COMPUTER APPLICATIONS with experience of FORTRAN BASIC, ETC to work on DEC, Hewlett Packard and Data General machines operating on a turn-key basis with minimal travelling involved. Salaries to £6,500.

The same client would also like to hear from candidates with 2 or more IBM languages and TP/DATABASE experience to work on clients premises in and around the LONDON AREA.

**COULD YOU MANAGE?** The West End offices of a nationwide Bureau Operation seeks young intelligent DP professionals with the experience or potential to tackle responsible management and supervisory positions. In particular:

**SURVEY ANALYSIS MANAGER** to head a Department engaged in Media and Market Research applications. You will need a good systems and programming background and some familiarity with IBM equipment would be an asset, but the primary requirement is for someone capable of moulding the Department into an efficient unit. A great deal of client contact will be involved and excellent opportunities for advancement exist for the right person. Starting salary £6,000 neg. The same client also requires a **PRODUCTION SUPPORT SUPERVISOR** who will be responsible for a team of three people writing and maintaining production ICL for a large OS Mainframe. Apart from using your good OS ICL knowledge, you will have the opportunity to meet clients, discuss their requirements and sort out their problems. While no actual shift-work is involved, you should be prepared to work flexible hours when necessary. Salary around £6,000.

**STOP PRESS:**  
**CONTRACT PERSONNEL.** WE PAY EVERY WEEK. TOP SALARIES IN AND OUT OF THE LONDON AREA AND HOME COUNTIES WE URGENTLY SEEK

**11 COBOL KICS DL/1** Programmers for Banking work. Central London. Start January 6 months  
**SYSTEMS PROGRAMMER** Conversion on IBM 360/65 to a AMDAHL Barn 3 months  
**IMS Expert.** Holland. 6 months.

Contact Sara Smith

**MARTON Associates**  
FOR COMPUTER PEOPLE AT THE CROSSROADS.

206/210 Bishopsgate, LONDON EC2M 4NR  
01-283 9237

**0206-61261**

**Stone Executive**

64-65 North Hill, Colchester, Essex



**MIDLANDS****A KEY ROLE IN — PROJECT MANAGEMENT**

Salary c£6,500 P.A. + Fringe Benefits

We have been asked by our clients to identify a Project Manager to work in their dynamic and developing environment. Applicants should be capable of developing, implementing and maintaining financial computer systems, utilising large IBM 370 series hardware, supporting increasing CICS on-line, and IMS data base systems.

Owing to the increasing scope and facilities at our clients Computer Centre the position offers exceptional challenge to imaginative computer professionals.

Candidates should be:

- ★ capable of demonstrating management and technical skills in a financial systems environment.
- ★ a graduate, or professionally qualified.
- ★ able to achieve results through people.

Working conditions and fringe benefits are excellent including generous relocation expenses.

CONTACT CATHY TRACEY, 021-236 3781

REF. NO. CW/11/21

**SPECIALIST COMPUTER RECRUITMENT LTD.****BIRMINGHAM 021-236 3781 FREEPOST**

Freeport, Equity and Law House, 35-37 Great Charles Street, Birmingham B3 2BR

**MANCHESTER 061-833 0676 FREEPOST**

Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

**LONDON 01-935 0671 FREEPOST 6**

Freeport 6, 102, Blandford Street, London W1E 1JZ

**SCR****PROGRAMMERS**SOUTH COAST  
COBOL OR ASSEMBLER  
c £4200Phone 01-439 8481  
(24 hours)  
EFFECTIA GRAVIS  
Personnel Consultants**CAPITAL APPTS.****FORTAN**

Programmers

Urgently required for Indus-

trial and Scientific Develop-

ment £3,000-£8,000

ALL AREAS

Telephone for free list of

VACANCIES

037 5551 day; 636 9659 eve

**SENIOR NUMERICAL  
CONTROL CONSULTANT**

LONDON, S.W.1. UP TO £6,000

SIA is an International Computer Bureau offering time-sharing, batch and remote batch processing services on dual CDC mainframes based in London. SIA is the market leader in technical computing and offers the largest and most comprehensive Numerical Control tape service in the U.K.

The rapid growth of SIA's N.C. tape service business has created the need for an additional Senior N.C. Consultant.

Applicants for this position should have several years experience in industry working in a software development and technical support capacity for computer-aided N.C. systems on large mainframe computers, and must have in-depth experience of programming in FORTRAN.

The successful applicant will be responsible to the Industrial Systems Manager for the software development of a rapidly expanding range of N.C. systems and the technical support of a large client base. This will involve consultation with client representatives at all levels. Excellent prospects, variety, interest and technical challenge are features of this post.

Benefits include a monthly bonus scheme, profit sharing, contributory pension scheme, LV's and good working conditions.

Please reply to: John Paton  
Industrial Systems Manager  
SIA Ltd., Ebury Gate  
23 Lower Belgrave Street  
London SW1W 0NW  
Tel: 01-730 4544

**sla****Shift Leader**

Required for a rapidly expanding ICL twin 2804 installation with local and remote communication systems.

Applicants should have 3 years' operating experience, with a minimum of 1 year on ICL equipment, and be prepared to operate on a three-shift rota.

Our terms and conditions of employment are excellent and include 4 weeks annual holiday, subsidised dining facilities, bonus and pension schemes, and an active social and sports club.

Applications should be made in writing to: Miss G.A. Weston, Personnel Officer  
BDH CHEMICALS LTD., Broom Road, Poole  
Dorset BH12 4NN

**BDH****QUADRANT RECRUITMENT****OPERATIONS  
MANAGER  
NEW 2903**

YORKSHIRE

to £5500

Our client is seeking an unusually capable operations person to set up and run two new ICL 2903 installations that will eventually have an extensive communications network attached. The main installation, where the position is based, is between Huddersfield and Sheffield.

It is likely that the successful applicant will be experienced on ICL equipment and will have worked in a communications environment. Previous management or shift leading experience will be necessary, together with the ability to grow with the use of data processing within the company.

Salary and conditions of service are excellent, and assistance with relocation to this delightful rural location will be given if necessary.

Bank House, Queen Street, Sheffield, S1 1UF.  
Tel: Sheffield (0742) 738794.

**COBOL PROGRAMMER**

S.W. LONDON

TO £4,900

A competent COBOL Programmer is required to work in our client's computer centre, which is conveniently located close to bus, main line and tube services. ICL 1902T hardware is operated under GEORGE II. A variety of financial and accounting systems are run using both batch and on-line enquiry techniques.

Work will be in project groups which are structured to allow personal progression. Knowledge of PLAN, GEORGE II, or FILETAB would be valuable but the essential requirement is the ability to produce working COBOL programs within realistic schedules. Training will be provided where necessary.

Benefits include — FLEXTIME, SEASON TICKET LOAN, PAID OVERTIME, EXCELLENT HOLIDAYS, COMPREHENSIVE PENSION. For 2 years' experience salary will be negotiable up to £4,900.

If you would like to join a small, professional yet friendly team, then telephone our CROYDON office or write quoting ref. CW66-7H.

01 686 9693 (1st HOUR ANSWERED) | 061 236 2419 (FAULKNER HOUSE)  
10 PARK STREET, CROYDON, SURREY | FAULKNER HOUSE, 1 MANCHESTER ROAD

COMPUTER AND PERSONNEL CONSULTANTS **CAPP ASSOCIATES**  
LONDON AND MANCHESTER

**Computer  
Programmer/Analyst**  
North Sea Oil-Aberdeen

Occidental, the operators for the Piper and Claymore North Sea oilfields, are committed to a continuing programme of expansion and development. Our small and highly skilled team of computer specialists play a significant role in providing technical and commercial data processing services to the entire operation.

The increase in these activities has created an opportunity for an experienced Programmer/Analyst who can take on the complete responsibility for various new technical applications, which range from helicopter scheduling to contour mapping. Candidates, male or female, should be familiar with time-sharing and data-base techniques and have had a minimum of four years' experience as a Computer Programmer.

If you believe you match our requirements and are seeking a challenging and rewarding career, please write with brief career details to:

Mrs. Ann Reynolds, Occidental Scotland Inc., 127 Causeway, Aberdeen AB9 3TF

**OPY****Berlei plans new ICL 2950****Analyst / Programmers  
Programmers****Slough**

Berlei is one of the industry leaders in the manufacture and marketing of foundation garments and swimwear.

They have a requirement for development staff at all levels, who can accept the challenge of developing new systems on ICL's most recently announced machine, the 2950 using TP and IDMS under VME/K.

The company has long recognised the benefits of ON-LINE systems (they have three Driver Programmes under Comms. Manager on their ICL 1902T) and the delivery of the 2950 in August 1978 is in accordance with their objective to put all major systems and files ON-LINE throughout the company and its seven factories.

Berlei require you to have a minimum of 2 years' programming experience using COBOL on any machine; some exposure to analysis would be welcome but by no means essential. Above all, if you really wish to be involved and to contribute to the well-being of your business, at the forefront of software design, join Berlei and its ICL 2950.

Salary will not present a problem to the right applicants and training will be provided as necessary.

In the first instance please contact John De La Mere on 01-549 3212 for further details.

**Future Systems  
Data Base Real Time  
Distributed Processing**

Cobol programmers are required in the West End. One of the most interesting and rewarding openings for mainframe programmers in recent years has arisen.

A major international company is on the threshold of a five-year development programme and wishes to recruit the first phase of its programming intake.

Already an existing IBM user, they will have to upgrade their 370 to cope with their Data base, Real time, and Distributed Processing systems development.

This ground floor opportunity is open to applicants with a proven record of Cobol programming on any machine.

Competent COBOL programmers will not find the salary a problem and will enjoy the benefits of working for a prestige company with technical training, career progression into analysis and management in addition to probable overseas travel to consult with users.

To secure an interview, please telephone 01-549 3212 and speak to Clive Hartrup.

**Sussex Coast  
Cobol Programmers  
c. £4800**

Are you tired of City life? Would you like a place by the sea? If so a bracing atmosphere awaits you in the south. You could join a development team in an interesting and stimulating environment. You can use your COBOL knowledge in the development of commercial and manufacturing systems.

Our client is embarking upon a significant upgrading of its D.P. facilities including an orientation towards management information systems. They offer excellent benefits and prospects as part of a progressive group, including relocation assistance where appropriate and a profit sharing bonus scheme.

Ring Stella Mitchell immediately to arrange your interview.

**CCC****SA** Computing  
Services  
Association

KINGSTON: 44 Wood Street, Kingston upon Thames, Surrey, England. Telephone 01-549 3212 (24 hours) Telex 27950  
DUBLIN: Canberra House, 24 Lower Leeson Street, Dublin 2. Telephone 762170/762188/785692 Telex 30742  
AMSTERDAM: 'Riversaete', Ampleveldijk 166, Amsterdam 1010. Telephone 461844 Telex 11336

**Technical  
Support  
Manager**Designate  
c. £8,500 p.a. plus car

RTZ Computer Services is an independent company, within the RTZ Group concerned with the development of computer-based financial systems.

The rapid expansion of the time-sharing division of this company has created the need for further technical support. Reporting to the Sales Manager the person appointed will be required to provide technical support for the sales team, organise customer training and generally assist in the resolution of clients' technical problems, both for pre- and post-sales.

Candidates should have a sound financial background with a working knowledge of FORTRAN and some experience of BASIC.

Ideally we are looking for someone in his or her late 20s who is carrying a similar range of responsibilities at present. We are also willing to consider applications from less experienced persons who are looking for an opportunity to grow with an expanding company.

RTZ Computer Services a member of  
the RTZ Group

Please apply in writing giving age, career to date and present salary or phone for an application form to: Philip W. L. Blair, RTZ Computer Services Ltd., 103 Jermyn Street, London, SW1 1. Tel: 01-830 4163.



## MOVE INTO SOMETHING NEW!! PROGRAMMERS—ANALYSTS—SYSTEMS ANALYSTS £4,000-£5,500

A major food manufacturer has a requirement for the following people

**JUNIOR ANALYSTS/SYSTEMS ANALYSTS:** These positions offer the opportunity to move into support and development areas of batch and on-line applications. If you are familiar with an IBM environment and are interested in the latest developments of on-line and database techniques, this could be the opportunity you have been waiting for.

The company currently uses IBM 370/148 and 145 mainframes with on-line database facilities, in a friendly and professional environment. Their modern premises are situated in the most picturesque rural surroundings in an easily accessible area of Surrey. If you feel that the time has come for you to enter a dynamic environment, where with the right training you can make a positive contribution to the company's expansion, then ring us for a preliminary discussion on 01-439 6299 quoting ref. no. W.G. 972.

**PROGRAMMERS:** If you have been programming for the past 18 months, preferably in a commercial environment, and feel that you want to use your past training to progress rapidly in an expanding department, then our clients want to see you. You must have a knowledge of PL1 and OS/VS 1 would be an added advantage.

## IF YOU HAVE REAL TIME EXPERIENCE MAKE A FRESH START IN 1978!

**SOFTWARE ENGINEERS CIRCA £6,000**  
**SYSTEMS PROGRAMMERS CIRCA £4,000**  
**ENGINEER PROGRAMMERS CIRCA £4,000** **LONDON AREA**

OUR CLIENT, A LEADING ELECTRONICS COMPANY WITH GLOBAL INTERESTS IS SEEKING PROFESSIONALS TO TAKE PART IN A MULTI-MILLION POUND PROJECT OF THE FUTURE.

**SOFTWARE ENGINEERS** — Preferably graduates in electronic engineering, with a sound knowledge of hardware and experience of writing software, probably in ASSEMBLER.

**SYSTEMS PROGRAMMERS** — Recent graduates in electronic engineering, they will have one or two years' systems experience.

**ENGINEER PROGRAMMERS** — Recent graduates in electronic engineering and conversant with hardware, they should have one or two years' programming experience.

- ★ EXCELLENT SALARIES
- ★ GENEROUS ANNUAL HOLIDAYS
- ★ SPORTS AND SOCIAL FACILITIES
- ★ RELOCATION EXPENSES
- ★ MODERN WORKING CONDITIONS
- ★ REAL CAREER PROSPECTS

IF YOU ARE INTERESTED RING JOHN FARGHER FOR AN INFORMAL DISCUSSION ON 01-439 6299

## Computer Appointments

Regent House, 54-62 Regent Street, London W1A 4YJ. Tel: 01-439 6299 a division of Graduate Appointments Ltd.

### Computer Appointments

#### TRAINEE SYSTEMS PROGRAMMER

circa £4500, Surrey  
You should have 2-3 years' operational experience of IBM systems under DOS or preferably OS. You should be aged around 22-25 and possibly have been employed in a technical support role. Must have written some assembly program. Ref. 221

#### SYSTEMS ENGINEER

Negotiable Salary, France  
Several years' experience of IBM DOS/VS, also GRASP knowledge would be helpful. Minimum 5 O Levels and the ability to speak French fluently. Some systems programming and assembly language experience preferred. Ref. 195

#### COBOL PROGRAMMER

to £5500 London, WC2  
1 year's experience or more, together with knowledge of IBM DOS job control. The position offers involvement with all types of development applications, including SCREEN programs, possible travel to Europe in a consultancy capacity, and an opportunity to move into Systems Analysis. Ref. 229

#### IBM OPERATIONS VACANCIES

SNR OP	155	OSVS1	3 shift City	c£5000	Ref. 227
SNR OP	145	OSVS1	3 shift E. Herts	£4000	Ref. 219
SNR OP	135	DOS/VS	2 shift Essex	£4000	Ref. 221
SNR OP	125	DOS/VS	2 shift S.E. London	£4100	Ref. 218
SNR OP	115	DOS/VS	1 shift City	£3800	Ref. 218
OP	110	DOS/VS	2 shift N.W. London	£3800	Ref. 212
OP	105	DOS/VS	2 shift Essex	£3600	Ref. 221
OP	100	DOS/VS	3 shift W. London	£3300	Ref. 122
OP	138	OSVS1	2 shift Essex	£3500	Ref. 230

call X-Calibur on 01-353 8201/3 or write to:  
47 Essex Street, London WC2R 3JF

**X-Calibur**  
COMPUTER SERVICES

### Computer Professionals — Training and Advice £6,000 Manchester

We have vacancies in our Training and Advisory Services Group for computer professionals to join our existing teams in Manchester.

Duties will comprise a mixture of tasks which include lecturing on computer training courses in UK and occasionally overseas, developing training resources including audio visual materials, and providing professional advice to organisations on aspects of computer usage. Whilst the posts are Manchester based duties will involve considerable travel.

Candidates will have a degree or equivalent professional qualification, a minimum of 3 years' experience in computing on a broad basis and preferably including both programming and systems work. Experience in either a lecturing or consulting role will be particularly valuable.

Starting salary: Up to £6000 in a range rising to £7340 (inclusive of supplement).

Conditions of service are excellent and include 25 days annual leave, 9 statutory holidays, contributory pension and life assurance scheme.

Please write with full details to: Personnel Manager, The National Computing Centre Limited, Oxford Road, Manchester M1 7ED, (or telephone 061 228 6333 for application form).

**NCC**  
The National Computing Centre

## System Software Controller

There is a vacancy at the Harwell Laboratory for a System Software Controller who will be responsible for the installation and maintenance of the system software of an IBM 370/168 computer. He or she will be concerned with the generation of operating system software and the control and testing of additions and changes to the software.

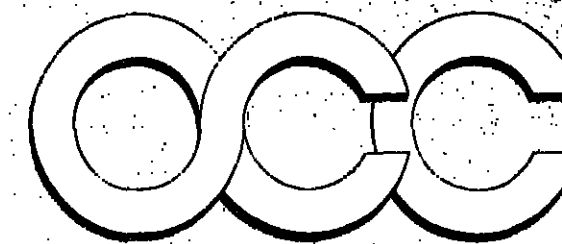
Applicants should have had experience of multi-programming operating systems, and those with a knowledge of MVS will have an advantage.

Alternatively, a working background of computer operations in the widest sense, with practical knowledge of systems software, could be acceptable.

Starting salary will be according to age and qualifications within the scale £2020 per annum at age 18 to £3165 pa at age 29 (highest starting pay), rising by annual increments to £3930. Pay supplements of £313.20 and of 5% of salary (subject to a maximum of £208.80 pa) are additional.

Phone or write for an application form to: Personnel Department 'B', A.E.R.E., Harwell, Didcot, Oxon OX11 0RA. Tel. Abingdon 24141 (STD 0235) Ext. 2059.

**HARWELL**



## occ computer personnel limited

### West London

**Salesmen (Male or Female)**  
**Earnings £6-£10,000 p.a.**

Our client is a thriving computer bureau, needing more salesmen in order to fully exploit the buoyant marketing situation which now presents itself. A new service based on intelligent terminals has recently been introduced, and this is being well received by the market.

Candidates must have sufficient systems and programming knowledge to understand the technical content of the bureau service, and must already be experienced salesmen. Ideally they will already have sold for a bureau, or have had experience in selling for a computer manufacturer. The sales area to be covered is in South London and Southern Home Counties.

Ref: 632CW/Neville John

### London

**Consultants & Programmers**  
**£4,000-£7,500**

**SYSTEM TEN & SYSTEM 1500**

Excellent opportunities exist with an expanding software house for experienced ICL SYSTEM TEN or SYSTEM 1600 personnel. Various Real Time projects, based in London and other UK sites, include a Building Society and a Hospital application as well as a software development project for communication systems network. The positions are based in West London or Reading. Opportunities to work on overseas projects also exist.

We are interested in ASSEMBLER programmers with several years experience, including a minimum of one year on SYSTEM TEN and/or SYSTEM 1500. We will also consider applicants with only two years' experience in COBOL and ASSEMBLER on other machines.

Senior candidates should have been involved in the successful implementation of a number of projects and must be able to assume a supervisory function as Project Manager or Team Leader.

Ref: 584/CW/Renée Nute

Salaries in excess of the maximum quoted above are negotiable for exceptional candidates able to justify higher salary expectation

### Reading

**Senior Operator**  
**Team/Shift Leader**  
**£3,000-£5,000 + s.a.**

Our client is a Software House with a well-established UK and Overseas market. Immediate vacancies exist in READING at a Computer Centre housing a number of ICL mainframe installations which provide a machine time service. Candidates should have experienced 1900 George 3 operators who ideally will also have had some experience of supervising operations staff. We would be particularly interested in applications from senior operators with a minimum of 30 months experience who are seeking a team leader position. Alternatively operators with at least 18 months' relevant experience, in addition to a potential ability to lead a small group, may wish to apply for senior operator positions.

The starting salary will be negotiable and depend on previous experience. A three shift, 5-day week system is involved for which a 20% shift allowance will be paid on top of the salary. These vacancies offer an opportunity to join a rapidly expanding organisation.

Ref: 102/CW/Sandy Lloyd

### Minis & Micros

**Analysts & Programmers**  
**£4,000-£6,500**

**Opportunities with Consultancies & Software Houses**

We have a continuing requirement for Analysts and Programmers with a minimum of 1 year's real-time mini and/or microprocessor experience who are interested in joining a Consultancy or Software House organisation. Vacancies exist at all levels and provide the opportunity to gain experience on many different types of hardware. Applications areas are varied, covering commercial, financial, industrial, scientific, military and process control, as well as basic software development and enhancement. Positions are mainly based in the South East, many also offering the opportunity of short and long-term overseas assignments.

Of particular interest is assembler experience on PDP-11, Nova Hewlett-Packard, Honeywell Series 16, Intel or Computer Automation hardware, but any Real-time mini or micro experience would also be of interest. Preference is for a good academic background and for many positions some mobility could be required. Salaries in excess of the figures quoted could be negotiated for exceptionally well qualified applicants.

Ref: 3011/CW/Sharon Matthews.

To apply for any of the above positions or for further information, please telephone the Consultant concerned during working hours on 01-242 9356, or write to the above address. If it would be more convenient to telephone in the evening, the telephone numbers are: Neville John — Farnborough (Kent) (66) 52017, Renée Nute — 01-874 6372, Sharon Matthews — Billerica (02774) 22351, Sandy Lloyd — 01-891 6168

Members of  
Computing  
Services  
Association

## OPERATIONAL RESEARCH IN GOVERNMENT

### Head of New Computer Unit

A new computer unit is being set up in Whitehall to give active assistance to operational research groups in the Civil Service Department and the Treasury tackling management problems which range from manpower planning to policy on public expenditure. The unit will advise OR scientists on the computing aspects of their work, and provide systems, programming and operating expertise.

Three appointments are to be made, the head of the unit and two programme managers, one of whom will assist with systems design and one who will liaise with computer service bureaux. There are prospects of promotion at each level and a non-contributory pension scheme. Starting salary will depend on qualifications and experience.

#### HEAD OF UNIT

(Ref: SB/5/CBI) Candidates (normally aged under 32) must have a good honours degree, or equivalent, in a scientific/engineering subject. They must have at least 4 years' appropriate postgraduate experience and a wide appreciation of scientific programming.

Some knowledge of OR is required. Appointment as Senior Scientific Officer: £5170-£8780.

### Systems/Scientific Programmers

#### SYSTEMS PROGRAMMER

(Ref: SB/6/CBI) Candidates (normally aged under 30) must have a good honours degree, or equivalent, in a scientific/engineering subject, and at least 2 years' appropriate postgraduate experience. They must have a knowledge of several programming languages and ability in systems design. Appointment as Higher Scientific Officer: £4230-£5440.

#### SCIENTIFIC PROGRAMMER

(Ref: SB/7/CBI) Candidates (normally aged under 27) must have a good honours degree, or equivalent, in a scientific/engineering subject and a knowledge of several programming languages. Appointment as Scientific Officer: £3070-£4610.

For further details and an application form (to be returned by 19 December 1977) write to Civil Service Commission, Alencon (0266) 65551 (answering service operates outside office hours).

**Science Group**  
CIVIL SERVICE

Please quote appropriate reference.

## Computer Operators

(Shift Leaders Designate)  
**Keston, Kent**

Seismograph Service is a geophysical contractor, heavily involved in search for oil, gas and minerals. Our Well Survey Division, which has been in size over the past 3 years, uses mini computers to process geophysical data obtained from wells throughout the world. Currently we are looking for Computer Operators who have the potential to become Shift Leaders.

The ideal candidates will have, apart from experience of operating in a scientific environment, 'O' level in Maths and/or Physics and a good knowledge of computer operations. Initial salaries, which include shift and overtime payments, will be £3,750 p.a. On promotion to Shift Leaders, earnings will be £4,500 p.a. Benefits are in line with a modern progressive company and include a pension and social club and subsidised staff restaurant.

Please write or telephone for an application form to Bruce Stirling-Hamilton, Senior Personnel Officer, Seismograph Service (England) Limited, Holwood, Keston, Kent BR2 8HD. Tel: Farnborough (Kent) 33355. Applications are invited from men and women.

### SYSTEMS MANAGER

Basildon, Essex

c. £6,500

Fithand International is a rapidly expanding British company specialising in the supply of pipe-fittings to the petrochemical and offshore industries. It currently operates a Honeywell 61/80 installation.

Responsible to the Financial Director, the Systems Manager will recommend the resources required to meet the Company's systems needs, develop and maintain all corporate systems, provide appropriate computer programmes and supervise the operation of the D.P. facilities.

Probably in late twenties, the Manager (male/female) will have a depth of experience in all aspects of D.P. and at least 4 years experience of programming in Cobol.

If you are ready to accept a responsible appointment demanding a high degree of initiative and drive telephone or write to John Houldham for further information.

Personnel Department 'B', A.E.R.E., Harwell, Didcot, Oxon OX11 0RA. Tel. Abingdon 24141 (STD 0235) Ext. 2059.

Kearney Management Consultants

134, Piccadilly, London W1V 9EJ  
Tel: 01-499 7181

### CAPITAL APPLS.

#### GRADUATES

Urgently required for training positions in Industrial, Scientific, Commercial, Statistical, etc. £3,000 ALL AREAS

637 5551 day, 636 9659 eve.

#### University of Bradford

#### ASSISTANT COMPUTER OFFICER/ COMPUTER OFFICER

Applications are invited from graduates of professionally qualified degree, with 2 years' and all field experience, to an appointment in the School of Computing Engineering to work on research group with on and off-line computers, using BASIC, FORTRAN, COBOL, etc. and assembler languages. Advice on postgraduate general programming work and the maintenance of documentation will also be provided. Opportunities exist for studying for a degree.

Salary is on a scale £2,804 - £3,100 per annum (dependent on qualifications).

For details, contact: Dr. J. B. Wilkin, Divisional Personnel Officer, Computing Centre, University of Bradford, Bradford, West Yorkshire BD7 1JG.

## COBOL PROGRAMMER TRAINEE ANALYST

**Leeds, £3,500 - £4,500**

The Weir Group's five steel foundries are served by a Data Processing Unit in Leeds where there are two vacancies for experienced COBOL programmers. The successful applicants will join a small team working with a Burroughs B1726, and on-line applications are envisaged for 1978. One of the positions will be filled by a programmer wishing to transfer to systems work within a few months.

Starting salary is negotiable and assistance with relocation expenses is available. Applicants should send personal and career details to J. B. Wilkin, Divisional Personnel Manager, Cation's Company Limited, P.O. Box 28, Leeds LS1 1JG.



## MERSEYSIDE SYSTEMS/PROGRAMMING/TRAINING OPPORTUNITIES

Due to a planned program of expansion, our Clients, a well established and respected Computer Services Company seek additional computer professionals to join their young dynamic department.

### SYSTEMS & PROGRAMMING MANAGER Salary:- c. £6,000

The ideal applicant should have a thorough grounding in systems and programming, preferably gained on a minimum of 2 manufacturers hardware. He/she will take responsibility for supervising the systems and programming department and participate in pre sales support, quotations and technical troubleshooting.

### SYSTEMS ANALYSTS Salary:- c. £5,250

Our clients also seek a systems analyst with a minimum of 3 years' data processing experience preferably gained on more than one manufacturer's equipment. The successful candidates should be well versed in commercial computing techniques and be flexible enough to tackle a wide variety of projects.

### PROGRAMMERS Salary:- c. £4,750

Programmers with a minimum of 3 years' experience, preferably with more than one commercial manufacturer, are required by our clients. The work will be of a project orientated nature and cover a wide variety of applications.

### TRAINING/LECTURING POSITIONS Salary:- c. £5,250

Our clients also seek a systems analyst and a person with an operations and programming background to assist in the development and presentation of formal training courses, primarily to new recruits entering the industry but also advanced courses to experienced students.

Excellent terms and conditions of employment apply, including a pension plus the excitement of working for a fast growing young company. Re-location expenses by negotiation. Initial interviews will be held in either Liverpool or Manchester.

CONTACT: David Wade on 061-833 0878

REF. NO. CW/11/26

### SPECIALIST COMPUTER RECRUITMENT LTD.

**BIRMINGHAM** 021-236 3781 **FREEPOST**  
Freeport, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR

**MANCHESTER** 061-833 0676 **FREEPOST**  
Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

**LONDON** 01-933 0671 **FREEPOST**  
Freeport 4, 102, Blandford Street, London W1E 1JZ

# SCR

## Computer Studies/ Automations Specialist

### Viking Gas Terminal-Lincolnshire

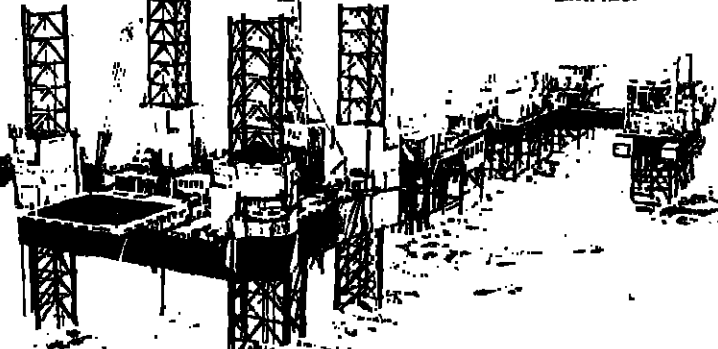
Conoco Limited, part of the international oil and energy group Continental Oil, wish to appoint an Automations Supervisor. Candidates should be capable of co-ordinating the activities of the hardware and software sections of the automations group in the provision of a communication, automation and administrative service to other functions in the Viking Natural Gas Operation.

The work will involve the review of computer application, both onshore and offshore, in the Viking Organisation to maintain and improve current systems of operation. This will also entail the scheduling and co-ordination of installation and maintenance of automation hardware, including computer telemetry and communications. Some programming/analysis work is involved and user liaison activity forms a significant part of the responsibilities.

The ideal candidate, male or female, will be aged 28-40, possess an advanced qualification in computer studies, or have undertaken a technical apprenticeship with considerable computer exposure. He or she will have 7+ years experience, at least 2 of which should have been in a supervisory role as project team leader. Experience of process control is essential (preferably in a real time environment) and of project work, from conception to implementation, is desirable. FORTRAN experience, and a second language (preferably ASSEMBLER) ideally using Hewlett Packard equipment and exposure to digital and analogue supervisory systems is essential.

Career prospects within our world-wide natural resource operations are excellent and varied. A very competitive salary will be offered, and overall terms and conditions of employment are excellent including a non-contributory pension plan and assistance with relocation expenses. Please telephone or write for an application form to:-

**Jeff Means,**  
Personnel Co-ordinator,  
**CONOCO LIMITED,**  
Viking Gas Terminal,  
Mablethorpe, Lincs.  
Tel: Mablethorpe (05213) 3553  
Ext. 128.



## IBM CONTRACT PROGRAMMERS

ALL LANGUAGES  
FOR IMMEDIATE CONTRACTS

PHONE 353-8201

X-Calibur Computer Services  
47 Essex St., London WC2

# X-Calibur

COMPUTER SERVICES

## HOWARD GERMANY - HAMBURG

Long Term (2 to 3 Years) Consultancy for up to 6 Financial Systems Architects - Designers with an in-depth knowledge of DATA Base Data Communications Associated with Large Financial Systems. Implemented on an IBM 370-158. Experience with VSAM, CICS, IMS would be an advantage as would a command of the German Language. Extremely Good Salary Package around £18,000 per annum. Ref. BJ/12117.

Please apply:  
G. Newton Tel: 01-953 4066  
Howard Organisation International  
Business Employment Section  
8 Elstree Way, Borehamwood  
Herts WD6 1LE

**OPS. MANAGER** London, EC  
This job involves control of 3 operators and trainee programmers using an NCR C76. Knowledge of B3 useful. No shifts, overtime paid, BUPA and mortgage assistance, etc.

**ANALYST/PROGRAMMER** Dorset  
Capable commercial person required for responsible work in this attractive location in Poole. Mature personality with RFG experience desirable. Database systems now being developed for the client's own and customer use. Variety of applications.

**PROGRAMMERS** N.Hants  
To C&K + interested in structured programming? If you have 2 years IBM COBOL or PL/I put it into practice with our client who offers generous salary and benefits.

168 Finchley Road, London, NW3 6HP

COMPUTECH 01-794 0202

## HERTS., BEDS. & BUCKS

**SALES SUPPORT** to £4,500  
Knowledge of terminal devices required to support extensive network users in choice of terminals. UK travel involved.

**ANALYST PROGRAMMERS** to £5,000  
3 years' Cobol/Assembler experience for a wide range of applications in a bureau environment.

**PROGRAMMERS** c £4,000  
Number of vacancies for 1 to 2 years' Cobol experience in all areas.

**SYSTEMS PROGRAMMER** c £5,500  
Good knowledge of DOS. Opportunity to develop tele-processing experience.

**VACANCY LIST**  
Ring us for our constantly revised list of vacancies in Herts., Beds., Bucks. & N. London.

Contact: Roy Brackenbury, St. Albans 61373.

**BLUE ARROW** STAFF HUNTERS  
Blue Arrow House, 3 Holywell Hill, St. Albans, Herts.

## AREA SALES MANAGER

Computer Products • Midlands and South West

Nashua Computer Products are going places - and we need a hard working, mature and self-starting professional (male or female) to drive up our market share in a key area. This embraces the Midlands, South Wales and the South West.

We sell a range of high quality magnetic media for computers and if you have the experience of the computer products market that we are seeking you will know that the range will give you plenty of scope.

The nearer you live to Birmingham the more time you will have at the sharp end but inevitably travel will be involved to get the best out of the territory. We will provide a Cortina 1600L and you will need a clean licence.

As part of a multi-million dollar international organisation we can provide scope for a progressive and rewarding career. Remuneration based on a substantial basic salary could well be into five figures after a short period.

To find out more, please contact John Moore, Nashua Computer Products, 1st Floor, Cory House, The Ring, Bracknell, Berks. RG12 1ET. Tel: Bracknell (0344) 52711.

# NASHUA

## TECHNICAL AUTHORS

required to write Software Manuals. Experience in Fortran or Cobol.

Contract in Paris.  
£5 per hour

Contact:  
Willin Writing  
Services Ltd.  
0262-41776

## COMPUTER PERSONNEL SAUDI ARABIA

EDP Operator and Computer Programmer with PDP 11 programming experience. Two-year contract. High pay free Salaries plus accommodation.

Rush resumes quoting reference CV.  
To: Advance Personnel Services  
The White House  
12a Lodge Road  
London, NW4  
or Phone: 01-203 4272

# Systems and Programming Consultants

£4500 to £10000 PLUS • Profit Share

- Free Life Assurance & Pension Plan
- BUPA family cover
- Holidays 21 to 26 days

If you would like to know more, then come along for an informal chat on MONDAY, 28th NOVEMBER, 1977, between 4 o'clock and 8 o'clock at

**THE CARNARVON HOTEL**  
**EALING COMMON** (next to the Tube)  
**LONDON W5**

If you cannot make it, telephone or write to

Shelagh Felgate  
CMG (Middlesex) Ltd  
Westway House  
320 Ruislip Road East  
Greenford UB6 9BW  
01-578 4563

**CMG**  
London • Amsterdam • Frankfurt  
Rotterdam • Brussels • Glasgow

## Computer Specialists

for on-going projects and new systems development.

There's probably more computer experience to be gained on Zambia's Copperbelt than you ever imagined.

At their Central Services Division, the two major mining companies - Nchanga Consolidated Copper Mines Limited and Roan Consolidated Mines Limited - operate a wide range of computer based information and control systems, and are among world leaders in developing computer applications to the requirements of their industry. Production capacity on Zambia's Copperbelt is some 700,000 tonnes of refined copper a year.

Applications are invited from experienced Systems Analysts and Programmers with at least 2 years' experience on IBM equipment using PL/I, to join (on a 2 year renewable contract) small teams engaged in new systems development and improving existing technical and commercial systems.

Equipment at each of the two Divisions - one at Ndola, the other at Kitwe - includes a two megabyte IBM 370/158 installation with extensive peripheral equipment.

**£5,400-£7,000 a year plus at least £3,000 tax free at the end of your contract**

### A great life

Salary? At least £5,400 p.a. at current exchange rates depending on experience and level of responsibility, and there's a tax free gratuity of 25% of salary, payable in the UK or country of recruitment.

Living conditions too are well above what you would normally expect in a developing country: good houses and flats - most of them with gardens; domestic help; excellent kindergartens and schools for young children.

And the climate? Zambia's is one of the best anywhere in the world. Ideal for round-the-year swimming, sailing, tennis, golf, with access to, fantastic scenery and safari-country side.

Other benefits include free passages to and from Zambia, low cost accommodation, generous paid leave, children's education and travel allowances.

If you are interested, and have the relevant experience with good formal qualifications, send us the coupon.

Please send me further details and an application form

NAME \_\_\_\_\_ AGE \_\_\_\_\_

ADDRESS \_\_\_\_\_

Position applied for \_\_\_\_\_

Experience \_\_\_\_\_

To: The Manager, Zambia Appointments Division,  
Zimco House, 129-139 Finsbury Pavement, London EC2A 1NA

# RCM NCCM

## CROSS COMPUTER GROUP LTD WIMBLEDON SW19

Cross Computer Group is a long established systems house and service bureau, which provides consultancy, systems design, programming and processing services to clients both in the U.K. and overseas. The Company believes in 'personal service' and pursues this approach with both clients and staff. Thus, a friendly working environment is offered in pleasant offices close to Wimbledon Station. Main line and tube services make travelling easy.

## Analysts and (to £6000) and Analyst/Programmers (to £5500)

Both our Development Department (specifying and writing new systems for clients) and our Customer Support Department (enhancing and maintaining existing systems) require Analysts and Analyst/Programmers at various levels.

We are seeking people with sound practical experience of at least 3 years duration; programmers should have ICL or IBM experience in COBOL.

In addition, the Group is involved in the development of on-line database systems, and applicants with experience in these areas would be welcome. Flexibility is important in consultancy and some flexibility in working hours can be provided if essential. Similarly, work overseas and travel within the U.K. is occasionally required but this can normally be avoided if necessary.

## Operations Controller (c.£5250)

The company's ICL 2904 System, operates as a service bureau for the processing of clients' work, as well as providing an in-house facility for development work.

The Operations Controller will be required to take responsibility for the day-to-day running of the unit. Duties will include:

- Scheduling and Work Allocation
- Supervision of DDE & Operations Staff, Data Control functions
- Security File Maintenance procedures, etc.

We are looking for an experienced Operations Supervisor/Controller, preferably with ICL 1900/2900 experience, who can also play a significant role in the further development of the installation. The key requirement is practical experience.

Please send a CV, write of telephone:  
Colin Shingler, Cross Computer Group Ltd,  
Bury House, 20-22 Worpole Road, Wimbledon, SW19  
Telephone: 01-847 7411 (daytime) or Weybridge 44753 (even.)  
24-hour answers



ICI HOLLAND BV, a subsidiary of ICI Ltd., produces and sells, among others, raw materials and intermediates for plastics and man made fibres. These are used for the manufacture of photo-film, clothing, plastic bags, furnishing fabrics and many other products. Well-known brandnames of ICI include: 'Perspex', 'Mellnex' and 'Terylene'. The modern plants are situated near Rozenburg/Europoort. The sales office for all ICI products is on the Wijnhaven in Rotterdam.

## Experienced system programmer

The ICI European Computing Centre is situated in Rozenburg. In that centre a team of system programmers is working.

- They occupy themselves with:
- generation and maintenance of system software necessary for the IBM 370/158 computer operating under SVS and HASP 4
  - generation and maintenance of IMS DB/DC
  - preparation of MVS operating system
  - development of standard software (utilities)
  - support of an extensive RJE and Real Time Network
  - advising the internationally operating developing teams.

The amount of work is large and expansion of the team of system programmers is very urgent.

- The new programmer must have:
- higher professional education
  - a very good command of the English language
  - experience in one or more of the above fields.

Please write application with full details to:  
ICI HOLLAND B.V., Postbus 1020, Rozenburg, Holland.  
On top of your letter please mention the code CW/R77-46.



## datascene

**SYSTEMS PROGRAMMERS**  
to £6500  
**TAKE YOUR PICK!**

Amongst the many, we have two exceptional jobs this week. Both offer real career prospects in a progressive environment, both are based in the West End of London.

The first is with a Software House operating an IBM system under DOS, although a knowledge of COBOL is essential. In addition, you should be familiar with CICS or TP Monitors. A background in high level languages is preferred, as is 3-4 years' Systems experience.

The second is with a national retail chain, operating an IBM 370/145 system under DOS/VSE, using POWER, GRASP, and IMS Databases.

If you have around 3 years' experience of ASSEMBLER, ring today.

These are just two of the jobs we have on hand. We have many, many more offering salaries between £3500-£7000 p.a. and benefits ranging from free lunches to cheap mortgages.

FOR FURTHER DETAILS CONTACT US NOW.

**Datascene Limited** **01-439 7871**  
Sceptre House 24-hour answering service  
169-173 Regent Street, London W1R 7FB

## datascene

**JUNIOR/SENIOR**  
**OPERATORS/SHIFT LEADERS**  
**ALL MACHINES**

ICL	01+	Data Control Manager	18mths	c.£3000
ICL	01+	Midlevel	18mths	c.£2800
ICL	01+	West End	1yr+	c.£2800
ICL	01+	North London	1yr+	c.£2800
ICL	01+	City	1yr+	c.£2800
ICL	01+	Data Controllers	1yr+	c.£2800
ICL	01+	City	1yr+	c.£2800
ICL	01+	West End	18mths	c.£2800
ICL	01+	West End	18mths	c.£2800
ICL	01+	Midlevel	1yr+	c.£2800
ICL	01+	West End, 2 shifts	1yr+	c.£2800

**PLUS MANY, MANY MORE!**

FOR FURTHER DETAILS CONTACT US NOW

**Datascene Limited** **01-439 7871**  
Sceptre House 24-hour answering service  
169-173 Regent Street, London W1R 7FB

## datascene

**WE'RE LOOKING FOR PEOPLE**  
**WHO CAN SET LIGHTS**

We're looking for Senior Mini Programmers who can set light to a multi-million project in the City. With the character and experience to lead software house staff, you should be familiar with a PDP 11 network and have an extensive knowledge of MACRO ASSEMBLER. A full benefits package is offered together with a high starting salary.

We can also offer other jobs with salaries from around £3500 p.a. They're mainly with software houses involved in businesses from factory to Retailing.

Whichever job you choose, you can be sure that it offers real career potential and that it has been tailored exclusively to you.

FOR FURTHER DETAILS CONTACT US NOW

**Datascene Limited** **01-439 7871**  
Sceptre House 24-hour answering service  
169-173 Regent Street, London W1R 7FB

## datascene

**SENIOR FORTRAN**  
**PROGRAMMERS**  
to £6500 N.W. London

If you can handle an IBM 370/138 system under OS and VSE, you're needed now for a challenging project by a Petrochemical Engineering company. A background in structural engineering would be an advantage.

We also offer exceptional opportunities to Fortran Programmers with experience in Finance, Operations Research, Engineering and Graphics.

Tring is available all over London and the Home Counties with clients ranging from users to software houses. Salaries range from £3750 to £7000 p.a.

Remember — the sooner you ring us the sooner you can start. So ring us today.

FOR FURTHER DETAILS CONTACT US NOW

**Datascene Limited** **01-439 7871**  
Sceptre House 24-hour answering service  
169-173 Regent Street, London W1R 7FB

## datascene

**JUNIOR/SENIOR**  
**OPERATORS/SHIFT LEADERS**  
**ALL MACHINES**

Burroughs	MCP	City — 2 shifts	2 yrs	£4500
Burroughs	MCP	Surrey — 3 shifts	1 yr	£4000
NCR	Any	City — days only	1 yr	£3500
NCR	Any	G. London — 2 shifts	1 yr	£3500
Honeywell	MCP	Surrey — 2 shifts	1 yr	£4000
Honeywell	OS 2000	G. London — 3 shifts	2 yrs	£4000
Honeywell	Any	Kenil — 2 shifts	8 mths	£3250
Univac	OS 4	W. London — 3 shifts	2 yrs	£4000
Univac	Any	W. London — 3 shifts	2 yrs	£4000

**PLUS MANY, MANY MORE!**

FOR FURTHER DETAILS CONTACT US NOW

**Datascene Limited** **01-439 7871**  
Sceptre House 24-hour answering service  
169-173 Regent Street, London W1R 7FB

## datascene

**PROFESSIONAL**  
**IT'S A RISK**  
**AND A CHALLENGE**

There are two main risks in job hunting. The first is that you may find yourself in a job. The second is that you may find yourself without a job at all.

When you come to Datascene, all you do with us once. Once we know what you want to do and where you want to do it, we can offer you a job that suits your specific abilities and requirements. Jobs that you stand a good chance of getting. And that takes the gamble out of seeking.

If you're looking for a job that offers a salary of up to £5500 plus other benefits, call us today.

All we ask is that you welcome the challenge of working REAL TIME BATCH BATCH or COMMUNICATIONS systems and have experience of COBOL, PL/I or FORTRAN on IBM, ICL, but any hardware knowledge would be useful.

Our clients range from Software Houses through the Retailers, Banks and other companies in all areas.

So, to avoid endless telephone calls and suspicious looks, ring us today. We'll put you a ring — that's all you need to get on.

FOR FURTHER DETAILS CONTACT US NOW

**Datascene Limited** **01-439 7871**  
Sceptre House 24-hour answering service  
169-173 Regent Street, London W1R 7FB

## 8080 .... 8085 .... What Next?

Micro Focus is looking for Systems Programmers, High and Low Level Language background, Mini, Micro experience.

We will put your talents and energy to work on new products. Permanent or Freelance.

Contact: Brian Reynolds, or Paul O'Grady, Micro Focus Limited, 18 Vernon Yard, Portobello Rd., London W1A 2DX. 01-727 6814.

### COBOL PROG.

GLOUCESTERSHIRE

c.£4,000 p.a. + benefits

Phone 01-439 6461

(24 hours)

EFFECTIA GRAVIS

Personnel Consultants

Metropolitan Borough of Wigan  
WIGAN (TERTIARY) COLLEGE OF TECHNOLOGY—DEPARTMENT OF MATHEMATICS AND COMPUTING

### LECTURER GRADE 1 in COMPUTER STUDIES

Required as soon as possible, a qualified person with good industrial and/or commercial data processing experience to lecture on a wide range of computer studies courses. Salary £2,499-£4,377 plus supplements of £312 and £132 - £180.

Further particulars and application forms from the Chief Administrative Officer, Parnis Walk, Wigan, WN1 1RR, within 14 days of the date of advertisement.

### PROGRAMMER

SOUTH COAST

COBOL OR ASSEMBLER

c.£4200

Phone 01-439 6461

(24 hours)

EFFECTIA GRAVIS

Personnel Consultants

## Senior Systems Analyst

Watford, Herts.

We require an experienced Analyst to join our Computer Services Department.

The work entails liaison with user departments, systems design and specification, liaison with programmers, systems testing and user training in both batch and on-line situations.

We have a mature installation with systems covering most facets of a competitive commercial environment. There is a large on-line system linking remote sites via VDU's and we believe that the main thrust of our future development will continue to be within the transaction processing field.

Analysts interested to know more should telephone Brian Corner, Manager Computer Services, on Watford 44381.

H. J. HEINZ CO. LTD.  
60 EXCHANGE ROAD,  
WATFORD, HERTS.

Heinz

## Guardian Royal Exchange Assurance

### LYTHAM ST. ANNES

Set in pleasant surroundings in a modern office block the computer centre is the hub of all the company's Data Processing operations. One of the country's leading insurance groups, we are involved in a wide spectrum of advanced project development and offer job security together with first class working conditions, facilities and prospects. Our present equipment includes a 370/158, a 370/155 (shortly to be replaced), 3350 and 3330 disc drives. We are currently running under OS/VSE (MVS is to be installed soon) and we use IMS extensively.

### Systems Analysts

to £5000+ benefits

To join project teams developing a wide variety of applications using the latest techniques including database and teleprocessing. The ability to deal with users on the one hand and experienced programmers on the other means that the successful candidates will enjoy a high level of involvement and will need to display a professional approach in a professional environment.

Benefits include: • Mortgage facilities at low interest rates • Relocation expenses • Non-contributory pension, widows pension and life assurance schemes • Flexible working hours • Paid overtime • Security of permanent employment in a long-term career with good promotion prospects • Excellent sports and social facilities • Easy access to the Lake District and Yorkshire Dales

### Application Programmers

to £4250+ benefits

With 1-4 years programming experience, to work primarily in PL/I (we are prepared to train successful candidates using comprehensive training facilities including the latest multi-media techniques). Programs are currently developed using modular techniques and structured programming in under active consideration.

Are you interested? If so ring me, up to 8.00 p.m. (weekends and reverse charges) or write giving career details under 'Private and Confidential' cover to: Alan Foort, Data Processing Department, Guardian Royal Exchange Assurance Limited, Ballam Road, Lytham St. Annes, Lancashire, FY8 1BB. Telephone Lytham (0251) 738701.

## MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

### SOFTWARE & APPLICATIONS COBOL PROGRAMMERS

#### MIDDX/SURREY BORDER

£5500

A SENIOR PROGRAMMER is required to join a recently formed Programming Team to develop On-line applications for this busy manufacturing Company. The Team, led by a Chief Programmer, will initially develop the software architecture for the new ICL computer; developing macros and familiarizing themselves with On-Line programming techniques. Several major systems are to be developed in the coming year permitting the Senior Programmer the opportunity of playing a key role in the design and implementation of On-line programs.

Although Programmers are required at both Senior and Junior levels, our Client is keen to recruit an experienced SENIOR PROGRAMMER in the first instance with at least three years' experience using COBOL.

The Company offers a pleasant working environment with favourable terms of employment.

### SENIOR ANALYST/PROGRAMMERS KENT TO £6000

The computing division of a major company, located in a pleasant area of the Kent countryside, is at present increasing their computing power and have several vacancies for experienced personnel.

Projects are varied and interesting and will include development of database systems. The company offer excellent prospects for promotion and general career progression, coupled with good training in a technically advanced and forward-looking department.

If you feel that such a position would afford you the opportunity to further your career and you are able to offer a COBOL programming background together with involvement in analysis, we would be happy to tell you more about the positions open to you.

### PROGRESS TO PROJECT MANAGEMENT

S.W. LONDON Systems Analysts OVER £6000

A major Service Company with interests in a broad spectrum of industry wishes to strengthen their systems team with the appointment of two Analysts who will initially aid the design of on-line systems.

The positions will firstly entail design involvement followed by leading development teams through to systems implementation in early 1978. The Company is installing dual ICL 2960 processors and has a country-wide network linking branch offices to their data centre in Fulham.

This is an outstanding opportunity for Analysts to gain large on-line systems experience as all necessary training will be provided for the right candidates.

Usual large company benefits are enhanced by an excellent career development plan which allows for rapid progression through analysis to Project Management and Consultancy within an expanding environment.

### DESIGN ON-LINE SYSTEMS SYSTEMS ANALYST

#### MIDDX/SURREY BORDER

£6000

A Systems Analyst is required to develop an On-line Production Control System for a busy engineering factory. The Company has recently taken delivery of a new ICL Computer and is in the process of building a small Systems Team of capable Analysts to assist with the development of an agreed Systems Plan. Reporting to the Senior Analyst, the successful applicant will take responsibility for the design and implementation of the System and will go on to develop a Work-In-Progress System.

Applicants should have AT LEAST TWO YEARS' ANALYSIS experience and have a knowledge of Production/Stock Control type Systems. Although On-line experience is not required, a keen interest in computer issues is desirable. The Company offers a pleasant working environment with favourable terms of employment.

Please telephone for a confidential discussion or write to:

30 Fleet Street London EC4Y 1AA  
01-353 5868

## COMPUTING ASSIGNMENTS UK AND OVERSEAS

### COMMUNICATIONS NETWORKING PROGRAMMERS AND DESIGNERS

Applicants with online message switching networking experience with knowledge of minicomputers and systems design. Vacancies exist in UK, Benelux, Scandinavia, France and Germany.

### FINANCE AND BANKING

Programmers, Analysts and Consultants conversant with IBM or NCR database systems in banking or insurance finance environment. Vacancies exist in Middle East, Belgium and London. Ref: MS 11/16.

### TELEPROCESSING, DATABASE CONSULTANTS AND PROGRAMMERS

Personnel with working knowledge of IBM CICS and IMS, CINCOM'S ENVIRON and TOTAL, ALTERGO'S SHADOW, TPS 1900, CORTEX or ADABAS and ROBOT. Vacancies exist in France, Benelux and UK. French-speaking applicants are required urgently. Ref: MS 11/17.

### PROCESS CONTROL SYSTEMS

Designers and experienced systems sales engineers familiar with PDP 8 and PDP 11 also knowledge of Microprocessor applications in industrial automation control systems. Vacancies exist in UK, Benelux and Scandinavia. Ref: MS 11/18.

Salaries and Conditions for All Posts Are Excellent

Please phone or write now to: John Staley



Malla Software (Agg)  
334 Euston Road,  
London NW1 3BD

Tel: 01-387 1603  
01-388 2284

## SENIOR RECRUITMENT CONSULTANTS MANCHESTER LONDON INCOME c£8K + CAR

"WE DIDN'T GET WHERE WE ARE TODAY . . ."

amongst the market leaders in the field of specialist computer recruitment . . . without offering a high standard of service to applicants and Client Companies alike.

We work on a truly national basis, through Regional offices, and through the application of professional standards and innovative ideas to recruitment related matters.

"ARE YOU AN SCR TYPE OF PERSON?"

A GREAT working environment with SUPER benefits — other Just Desserts are available to dedicated, hard working persons with a proven track record in Personnel Recruitment or persons with a sales orientated background, and a true desire to work in the recruitment field.

CONTACT: CATHY TRACEY, in the first instance, on: 021-238 3781.

REF: CJ/01-

### SPECIALIST COMPUTER RECRUITMENT LTD

BIRMINGHAM 021-234 3781 FREEPOST

Freeport, Equity and Law House, 33-37 Great Charles Street, Birmingham B3 2BB

MANCHESTER 061-833 6076 FREEPOST

Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 6471 FREEPOST

Freeport 6, 102 Blandford Street, London W1E 1JZ

Computing  
Services  
Association

SCR



## DATABASE/ REAL-TIME London W.1.

Development of major new systems, including DATABASE (DBMS) and REAL TIME applications, plus phased transition from ICL 1900 to a large 2900 configuration. This created several excellent career openings at our clients. West End installation. Training in modern techniques will be given where required. This is a well organised environment, working to high standards on large scale systems. We have been retained by a major organisation to recruit for the posts listed below, and would welcome an opportunity to discuss the openings with you. Please ring us, quoting the appropriate reference, or leave a message on our answering machine after hours.

Tel: 01-637 5796



**EDP Systems**  
52-53 Margaret Street  
London W1N 7FF

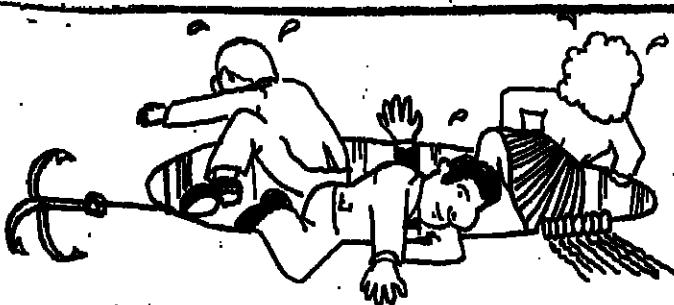
Appointment	Salary Up To	Job	Requirements
<b>DATABASE SPECIALIST</b>	<b>£7500</b>	To lead Database Team (5) as the senior advisor/planner in this field at the installation, with responsibility for major on-line applications, using ICL 2980.	Upwards of six years' computing experience, including database design and implementation, plus communication ability.
<b>SNR. SYSTEMS ANALYST</b>	<b>£6250</b>	Analysis work on major systems, including feasibility studies, proposals, implementation and user presentations, both ICL 1900 and 2980.	Upwards of five years' D.P. experience, including significant systems analysis and design, plus a degree knowledge.
<b>ASST. CHIEF PROGRAMMER</b>	<b>£6250</b>	To lead a team designing and implementing an on-line system on ICL 2980, from design through to implementation, using database facilities.	Upwards of four years' programming experience on ANY MAINFRAME, knowledge of a modern operating system, plus leadership ability.
<b>SOFTWARE PROGRAMMERS</b>	<b>£5200</b>	To work in small team of user facilities and support, ICL 2980, including changes to VME/B operating system, and MAC, TP and IDMS software.	2-3 years' programming experience on ANY MAINFRAME, including a large machine operating system and special purpose software.
<b>APPLICATIONS PROGRAMMERS</b>	<b>£5200</b>	To work initially on ICL 1900 in COBOL (possibly with some PLAN), under George II and in transition to due course to COBOL on 2980. Applications include transaction processing and the use of databases.	2-3 years' programming experience, including COBOL, on ANY MAINFRAME. A working knowledge of PLAN would be valuable.

## Cobol Programmers unrunt yourselves

Stimulation, variety, an invigorating work environment, new problems to tackle, rewards to match your ability—that is our offer. Marcol are fairly new to the computer software consultancy scene in Britain but already we are well established. Formed just five years ago, our aggressive dynamic, unflinching approach has earned us a sizeable share of the market and we are now poised for further expansion. We consider ourselves the best in the field—and with reason. People are our major asset and when we recruit we have the resources and opportunities to attract the best.

**MARCOL**

Dynamic Systems for tomorrow's needs



## Analysts and Systems Programmers

TSB Trust Company Limited is the Life Insurance and Unit Trust Company of the Trustee Savings Banks and is situated in a modern office in Andover Town Centre.

The Company is taking delivery of a B3800 configuration early in 1978. This equipment will provide processing facilities for an advanced integrated system with real time characteristics. System development and implementation will take place over several years, resources being provided by an outside software house and by an in-house development team.

Current in-depth experience in at least two of the following fields is mandatory:

Real time applications  
Data Base technology  
Burroughs Medium Systems

This is an unusual opportunity to join a long-term project of outstanding interest at an early stage of development.

Applications should be addressed to:

Angela Chris, TSB Trust Company Limited,  
P.O. Box 3, White Bear House,  
21 Chantry Way, Andover,  
Hants. SP10 1PG.

Applications should arrive not later than 2nd December, 1977.

**TSB**

**IT Tops Rule OK!**

**I've had two years Experience!**

**There was a young Op from the Now Senior Op he enjoys quite a lot and they call him Computing's Mr. Wonderful!**

**I'VE DONE IT WITH A HONEYWELL 66/20 My Mother made me!**

**Computer Operator**

**MAKE YOUR MARK AS A SENIOR OP AT EARN UP TO £4,000**

**IT LIKE MEN AND WOMEN TRUE**

**Phone Trevor Mirams, Chief Op on Harlow 025811**

## U.K. SPEARHEAD! SALES EXECUTIVE

Basic min. £6,000 + comm.

Fabulous opportunity to learn ahead by joining major U.S. growth transfer '81 in the world marketing a much sought after Mini Computer (over 6,000 systems installed in 1976). Your market will consist mainly of large potential end users, whom you can derive maximum sales from big orders. Further earning an income in excess of £10,000. You will need to be confident and ambitious with sales experience in U.K. and Home Counties. Start basic min. £8,000 + Opa Centre car. Call now! Ref. 551018

cc EXECUTIVE (KINGSTON) 01-548 9473

## COMPUTER MANAGER/ PROGRAMMER

An individual is required to assist in the development and then to continue the management of a trading system presently based on a PDP-8. The system has strong mathematics is required. The job is suitable for somebody who wishes to go beyond the purely technical aspects of computing. Please apply in writing to A. J. Clark, Technical International Limited, 21 Mincing Lane, London EC3A 4TH.

## Communications Technicians Data networks

Atkins Computing have become established as one of the leading timesharing and remote access service companies in the UK with several regional branches and a link into Europe. As part of our planned growth we need a Communications Technician to assist in the development and maintenance of our computer based data communications network. The person appointed should be able to act on his/her own initiative and responsibilities will include network supervision, fault diagnosis, troubleshooting and first line repairs by board replacement.



Candidates should preferably have some experience of Digital equipment and a relevant technical qualification such as City & Guilds Telecommunications Technician Certificate.

We offer progressive employment benefits, pleasant working conditions and relocation assistance where necessary.

Interested? Then write to: Alan Lewis, Atkins Computing, Limited, Woodhouse, Ashley Road, Leeds LS11 4TH.

Telephone 0113 275 4881 Ext. 38

## London

### System Support Analysts

Up to £5,500  
+ Car, Bonus, Benefits

Our clients, one of the World's leading manufacturers of Computers, are now recruiting to meet a continued expansion within the U.K. They are particularly looking for support staff to back up their dynamic sales division marketing technically advanced stand alone computers, mini-computers and teleprocessing equipment.

We have been retained to look for ambitious men or women with the following qualifications:

- \* Suitable manner, demeanour and personality to work in a sales environment.
- \* In-depth software experience, preferably in ASSEMBLER languages/COBOL/FORTRAN, and knowledge of operating systems.
- \* General hardware knowledge.
- \* High degree of personal motivation and initiative.
- \* Preferably a Degree, HNC or equivalent.

Desirable, but not essential, additional experience would be that you have worked with a computer manufacturer in a systems support role, as would experience in such areas as data base, data communications, etc.

These are exciting and rewarding opportunities to join a fast growing company. Our Clients not only offer the usual benefits associated with big organisations but also have an extremely attractive bonus scheme.

For further information please contact the Advising Consultant quoting the appropriate reference number CW/411/1.

HUTTON EXECUTIVE SELECTION LTD.  
HUTTON HOUSE,  
HUTTON STREET, LONDON EC4Y 8HR.  
01-353 6187 (Office Hours)  
01-353 1436 (Answerphone Service)

**Hutton**

## Holland

### Permanent Positions Short and Long Term Contracts Applications Programmers Software Programmers Programmer Analysts Project Managers

Hutton Executive Selection Limited are pleased to inform you that two of their Directors will be in the Netherlands during the week beginning the 5th December to discuss with several leading companies the recruitment of permanent and contract staff from Great Britain.

If you are a Computer Professional and are seeking a position in Holland, then please contact our advising Director immediately who will be pleased to give you further information.

THIS SERVICE IS COMPLETELY FREE TO ALL OUR CANDIDATES, PLEASE TELEPHONE PROMPTLY. Reference number CW/411/2.

HUTTON EXECUTIVE SELECTION LTD.  
HUTTON HOUSE,  
HUTTON STREET, LONDON EC4Y 8HR.  
01-353 6187 (Office Hours)  
01-353 1436 (Answerphone Service)

**Hutton**

## SOUTH EAST-THAMES REGIONAL HEALTH AUTHORITY

### Systems Analysts and Programmers

Salaries on scales  
ranging from £4408-£6487

At whatever level you join, the variety of work, the ambitious schemes afoot, the salaries, the freedom to use initiative, and the opportunities to go places, together add up to some of the most exceptional jobs in this field. The location is easily accessible by bus, tube and train, plus free car parking facilities.

The Regional Computer Centre provides computer services for Health Authorities in South East England dealing with everything from payroll to supplies to monitoring child health care, and employs about 150 people. The mainframe computer is an ICL 1904S (128K) with discs, tapes, printers, communications processor and associated peripherals.

For Systems Analysts the work involves going out frequently around the Region, meeting people, accumulating considerable knowledge of health service activities. After this fact finding stage you will often conduct feasibility studies then see the project through to implementation and monitor post implementation performance. If you have the ability there are avenues for progress to top level appointments.

For Programmers close liaison with your project team provides an added stimulus plus the interest of advanced programming techniques. There is opportunity for promotion to more senior grades or to Systems Analyst work.

A particularly interesting project which the Centre is undertaking is a joint experiment which concerns evaluating three major systems applications in Tunbridge Wells and Bromley as well as comparing the performance of two different manufacturers' equipment. Maybe your background makes you an ideal candidate to become one of the evaluation team.

To find out more, telephone or write for an application form to:

**SE** Regional Computer Services Offices  
South East Thames Regional  
Computer Centre  
Brook Drive  
London SE11 4TH  
01-735 4881 Ext. 38

Closing date for applications 9th December, 1977

## Operators to Shift Leaders

£2,000-£4,000 (incl.)  
LONDON & HOME COUNTIES

We have many vacancies covering all types of machines and locations. Some firms will retain from one manufacturer to another. Remember these positions are for shift working only. Hurry whilst stocks last. CW 47/1, Peabody.

## Mini Computer Programmers to £6,950

U.K.  
Your experience is required now. A very large number of vacancies are registered where a knowledge of Assembler or communications experience is essential (VRC programmers would also be considered). Opportunities exist in S.W., N.W. or W. London, Surrey, Hants and Manchester in this exciting and rewarding field. There has also been registered some overseas posts to people with 5 or more years in mini computers. CW 47/2, Michael.

## Systems Consultants £6,000-£9,500

CENTRAL LONDON  
Seven large well-established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require a first class service. Technical communication consultants are also required where in-depth implementation experience of IBM or ICL TYP message switching networks, etc. are essential. Excellent fringe benefits and prospects. CW 47/3, Michael.

## RPG II Programmers

£4,000-£6,500 +  
LONDON & H. COUNTIES

We now have eight commercial companies who have vacancies for RPGII programmers and Analyst Programmers. Jobs exist in C. London, W. London, Middlesex, High Wycombe, Croydon and in Dorset. Most firms offer LV's, 4 weeks' holidays, inc. CW 47/4, Amette.

## Successful Salesmen to £12K quota earnings

U.K.  
We now have ten different firms for both hardware and systems only companies who are anxious to meet successful salesmen in the industry. They must have previous relevant small systems experience (some VRCs will be considered). All firms have bonus schemes and cars or car allowance. Most positions in S.E. England, but 2 in Midlands. CW 47/5, Michael.

## Time Sharing Programmers to £6,000

C. LONDON  
If you have had time sharing experience involving the use of FORTRAN, BASIC or ASSEMBLER, then we have four nationally known companies who would offer you an exciting job in pre- or post-sales support. Some offer generous bonus schemes. CW 47/6, Michael.

## Technical Authors W. London & Herts. £5,000

Four manufacturing companies are looking for competent technical writers with brief or no experience. CW 47/7, Michael.

## Contract Programmers to £190 p.w.

U.K.  
Immediate requirements for IBM RPG II & IBM COBOL under DOS or OS for C. London, W. London, Middlesex, High Wycombe, Croydon and in Dorset. Most firms offer LV's, 4 weeks' holidays, inc. CW 47/8, Michael.

## SYSTEMS PROGRAMMERS ANALYST/PROGRAMMERS

SALARY £4,500 to £7,500 p.a.  
with additional benefit

Alimand Management Services Ltd have specialised with an acknowledged degree of success in Mini-Computer applications currently concentrated in the banking and financial sectors.

Following sure and steady expansion we are currently recruiting efficient and mature personnel to fill interesting and demanding assignments in the UK and the Americas. There are a range of opportunities from one year's experience upward, with details of experience to: Alimand Management Services Ltd., 250 Brompton Road, London SW3 2AT.

## Are you satisfied

that your present job, salary, location and prospects are all that you want them to be? If you're not, come and talk to one of our consultants. They understand the problems. They know the market across the entire DP field, including Sales.

Telephone 01-637 9611 or post the coupon today.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
Postcode \_\_\_\_\_  
Telephone \_\_\_\_\_

MANAGEMENT & EXECUTIVE SELECTION  
Suite 201/6 Albany House,  
324 Regent Street, London W1R 5AA



who is capable of growing with the organization and developing the department to cope with increasing sales volume and stock-inventory.

If you are in your mid-thirties, suitably experienced and currently in a similar (or will convert) We can offer you excellent career prospects and a higher salary than you are getting now.

Write or phone us the first instance, giving enough details of age, experience and current earnings to make an application form unnecessary to Ken Burnett, Lee Jackson & Partners, Ltd., 5 Lower Telford Street, Birmingham B4 7UB (Tel. 021 625 4545) or by airmail to the above address. All communications will remain strictly confidential.







## INTERNATIONAL TRAVEL CO.

Excellent Salary + Tax advantages + Car + Bonus + Holidays Concessions

COMPUTER SERVICES MANAGER designate

U.K. and HOLLAND

Our client, part of a large International Travel Organisation, operating worldwide, are setting up a new Computer System in London to mirror the system being developed in Holland by the parent company. You will be based in London for approximately 4 months to learn about the company and the new computer to be installed, and you will then spend up to 2 years in Holland working with the systems development group at the parent company. You will return to London with the system and install it on the new computer. You will be responsible for setting up a D.P. unit and staffing it. There will be travel between London and other European locations. You should be between 25-35 years old, and have at least 2-3 years' experience of data processing, good knowledge of COBOL/ASSEMBLER and Communications. You will need initiative, perseverance and the ability to organise and get things done. Mother tongue must be English (some knowledge of German would help). The company offers a U.K. salary of £8,000-£7,000 plus a special overseas package in Holland. A company car will be provided. A large bonus is paid on implementation of system. Special holiday-travel concessions are also available.

This is an exceptional opportunity. For discussion, please telephone the Senior Consultant quoting Ref No CW163



Insight Marketing & Personnel  
Consultants Ltd.  
72-75 Marylebone High Street  
London W1M 4AJ  
Telephone: 01-486 5644

## OPPORTUNITIES IN IRELAND

SYSTEMS SUPPORT SPECIALISTS

DUBLIN £6K+

Our client, a major international computer manufacturer, with a large market share, a successful marketing program, and an extensive installation schedule—has immediate need for experienced and talented systems specialists to join their support group based in Dublin.

They require highly motivated and ambitious persons with a strong programmer/analyst background, and sound business/commercial knowledge to work with both pre-sales and post-sales support teams.

If you have experience in the following areas — WE WANT TO HEAR FROM YOU.

Small Systems Group  
— System Ten, System 3,  
— Interactive applications

Medium Systems Group  
— 2903/4, 360/370, Series 60 or other  
medium systems  
— Teleprocessing and Data base applications

Opportunities exist for you to work in the project management mode guiding user companies to install and implement new systems, or you can use your "creative ability" in pre-sales mode to assist the sales force to expand the company's business.

### The Rewards

A high basic salary, first-class fringe benefits, and a top grade training program will ensure career progression, and that you are one of the highest paid members of the industry relative to your contribution and experience. Ref. CW164.



I.M.P.C. (IRELAND) LIMITED  
Insight Marketing & Personnel Consultants  
33 Mespil Road, Dublin 4  
Telephone 681277  
Please telephone Pat Rafter or Pauline Healy

## THE LONDON HOSPITAL (WHITECHAPEL)

We might not pay you the most but give us a try: come and join our lively and progressive Computer Department developing and supporting real time services for the London Hospital. Partly funded by the Department of Health and Social Services and partly by Tower Hamlets Health District, this is a unique experience in computing in a non-commercial environment.

Situated in a new, modern building near the hospital, the computer centre is within easy access of good sports and social facilities: squash and tennis courts, swimming pool and social club, and it is only 30 minutes by Tube to Oxford Circus.

We can offer you variety of work and good prospects for advancement in a continually developing field based on 2 UNIVAC Mainframes, and a communication network of mini-computers and over 70 terminals in wards, laboratories and offices.

Salary for intermediate operator £4133-£5185 p.a. inclusive. Applicants should have had a minimum of 2 years' experience.

Salary for basic operators £3496-£4133 p.a. inclusive. Some experience as a trainee operator and/or with compatible equipment preferred.

Application forms from

Sue Clark  
Personnel Services  
The London Hospital (Whitechapel)  
London E1 1BB  
Tel. 01-247 6464, Ext. 388  
Closing date: Tuesday, December 6, 1977

## GIBSON

Computing Services

MINI MICRO COMPUTERS  
COMMERCIAL SALES  
APPOINTMENTS  
INCOME RELATED TO TURNOVER  
£10,000/£25,000

We have been appointed O.E.M.s for possibly the most commercial manufacturer/supplier of Real-time Mini & Micro computer systems in the U.K.

These appointments are for sales personnel with a proven record of selling experience in some of the following:

Mini Computers  
Bureau sales  
V.R.C.

Micro Computers  
Mainframes  
Terminals

Income is on a commission only basis (probably the highest in the industry) full product training will be given by the manufacturer. The company will pay further commission on achievement of target.

It is envisaged that a successful salesman will be offered a partnership in the company. If you can meet this challenging appointment, write including a career resume to:

GIBSON COMPUTING SERVICES  
10 ADELAIDE ROAD, BRAMHALL, STOCKPORT.  
TEL: 061-439 3618

## Charles Barker Recruitment Confidential Reply Service

Please send full career details and list separately companies to which you should not be invited. Your reply. Write the reference number on the envelope and post to our Medical office, Kennedy Tower, Snow Hill, Curzonway, Birmingham B4 6JB

## Programmer

West Midlands Up to £4,000

Our clients, who provide computer services for a substantial group of companies, require a fully-trained programmer for their processing centre in the West Midlands. Applicants (male or female) should have sufficient experience to be able to work without supervision. Age is immaterial, but a knowledge of APC or assembler is essential. Benefits and conditions are in line with large group practices.

As U.K. Distributors for numerous International Manufacturers we now require additional

## SALES EXECUTIVES

experienced in all types of

## DATA PRINTERS

to take charge of individual product lines.

We have recently acquired the OEM Agency for HERMES matrix printers and card handling devices and are now looking for experienced Sales Executives to promote these high quality Swiss machines on the U.K. market.

For further details write, ring or call:—

## DATAPLUS

Ron Brotherhood Limited  
111 Promenade, Cheltenham  
Tel. 0242 30030



£4,000

## PL/1 Programmer

The makers of G-Plan furniture are seeking a programmer with at least 18 months PL/1 experience to join a small team.

The installation is a 370/125 operating under DOS/VS with POWER and we are currently implementing a trial T.P. Order Entry system under SHADOW/II.

The successful applicant will be expected to show considerable initiative and work with minimum supervision.

Conditions of service are very good and the salary will be around the £4,000 mark. Assistance will be given with relocation expenses where appropriate.

Send your details of experience, to  
Company Personnel Manager  
E. GORME LIMITED  
P.O. Box 27, High Wycombe, Bucks.

## Programming Professionals

New B6700 installation in Hampshire

## Computer Operator

International Container Operations

Associated Container Transportation Services is part of a consortium representing five major British shipping companies and provides a wide range of specialist services connected with container shipping throughout the UK and the Continent.

At our Southampton Head Office we currently have a Honeywell 20/60 and a Burroughs 2700 machine and in April next year will be installing a B6700 with an on-line data base communications network.

Due to internal promotion we now require an operator, male or female, with one or two years' experience of Burroughs 08 00-16 00 and 15.30-23.30.

Salary will be up to £3484 per annum, depending on experience, plus 12½% shift allowance, fringe benefits include 4 Sp LV's, four weeks' holiday, contributory pension and personal sickness and accident schemes.

Please write or telephone for an application form to Mrs. J. A. Chandler, Assistant Personnel Officer, ACT Services Limited, Richmond House, Terminus Terrace, Southampton. Telephone: Southampton 34433 ext 3305.



Associated Container  
Transportation Services Ltd.

## ACCOUNT MANAGER and SENIOR SALES EXECUTIVES £16,000 +

A major international company has a requirement for senior sales executives to sell a range of well established and highly respected computing equipment.

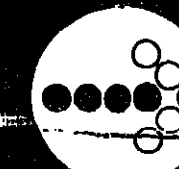
Candidates will ideally have experience of both commercial and engineering applications via the sales of either computer hardware or services. They will also be accustomed to dealing with large private and public organisations at the highest possible level.

Total remuneration will be in keeping with these prestigious selling opportunities, bringing on-quota earnings in the range £12K to £16K plus company car.

These appointments are open to both men and women.

Please write to Alan Williams with full details of your career to date.

## SMR SALES and MARKETING RECRUITERS LTD.



12, Lambs Conduit Passage,  
Red Lion Square, London WC1R 4HR  
Telephone: 01-837 9281

A SALES and MARKETING SERVICES COMPANY

## Cheshire COMPUTER OPERATORS

Up to £4,500 p.a. plus 37% shift allowance  
Chester

We are looking for experienced computer operators for our IBM 370/146 Model 3 which runs under OS/VS1 and supports CICS/VS, RTAM, ATMS/STARS and TOTAL. We are also running D.O.S. jobs using a D.O.S. Emulator. The T.P. Network has 8 remote users with 30 terminals and there are another 17 terminals within Computing Services.

The computer operates 24 hours per day every day of the year including all weekends and Bank holidays.

The operators work 12 hour alternating shifts with 3 days on and 3 days off.

Application forms are obtainable from Computing Services, County Treasury, Cheshire County Council, County Hall, Chester CH1 19g. Tel: Chester 602138, Reference C58/3/MW.

## LONDON BOROUGH OF ENFIELD

## A Person to Specialise in Software

£5,494-£6,055

Applications are invited for this post in the Borough Treasurer's Department. The successful applicant will be responsible for advising on and implementing software in addition to supervising programming standards. The Borough's computer installation currently consists of a B4K ICL 1902T and is developing a terminal system.

An application form is obtainable, upon receipt of a completed form, from the Borough Treasurer, P.O. Box 54, Civic Centre, Silver Street, Enfield, EN1 3XZ. Closing date the 2nd December, 1977. Please quote reference ORA/41.

## UNIVERSITY OF ABERDEEN COMPUTING CENTRE

## PROGRAMMING ADVISER

Invitations are invited for the above post within the mathematical and scientific advising group. Applicants should have a good honours degree in mathematics or a science subject together with appropriate experience of programming in Fortran or another scientific language. A knowledge of statistical methods would be an advantage.

Salary on scale £3333-£5827 p.a. (under review) with appropriate initial placing.

Further particulars from the Secretary, The University, Aberdeen, with whom applications (2 copies) should be lodged by 12th December, 1977. (Telephone 0224 40241, extn. Old Aberdeen 6353 for details.)

## DATABASE TECHNOLOGY LIMITED

## PROGRAMMERS

with experience in Base for Accounting System Development. Top salaries paid.

Contact: Mr. M. Jones  
31a High Street  
Aldershot  
Hampshire  
Telephone: 0252 316739

## THE SALES BIT

## Beware this type of salesman

THE first thing to ask yourself is, why should a successful salesman want to leave his present job to come and work with your company for a similar income package to the one he already has? After all, if he's a winner his present employer will be anxious to keep him.

From the salesman's point of view, change demands careful consideration of the financial implications of the "commission trough" and also the risk of not really knowing how near to the truth is the rosy picture his prospective employer has painted.

Then there's the people bit. Will he fit into the establishment of another company?

Then, of course, there are "futures" to be considered. Can he be assured that his new employer is still going to be in business this time next year?

There is so much insecurity in the process of changing jobs that a successful salesman needs to have very positive reasons for doing so. Undoubtedly the most common reason why salesmen change their jobs is because their sales manager has suggested that it might be a good idea.

That is one type, but of course many salesmen seek a change of company for completely valid reasons. The most common justifications are ineffective sales and company management, inadequate product, ineffective marketing strategy, lack of ongoing product development, unsatisfactory rewards, career limitations, and unfortunate personal relationships.

The hallmark of the effective recruiter of salesmen is his ability to quantify the credibility of the apparently justifiable reasons that come from all salesmen seeking to change their jobs, accurately placing them in one of these two categories, and then taking the appropriate constructive action.

To do this efficiently, the interviewer must have significant expertise in sales management and selling rather than simply being a professional interrogator. Otherwise, he will fail to identify the subtleties of candidates' reactions to well considered sales and marketing questions, and be deprived of the benefit of that "gut feeling" of experience which is always more reliable than face-values.

If you must recruit experienced salesmen rather than growing your own from the trainee level, then still look on them as trainees, starting at a higher level. Do they look like a good ongoing investment? Do you have the resources to exploit their real potential and cover for their inadequacies? Will they fit into your existing team? If the answer to any of these questions is no, then you shouldn't be offering them a job.

Remember the golden rule, when in doubt, don't. So you are under pressure from your boss and you are below sales complement. Don't let yourself or your company be forced into risk situations. Choosing the wrong salesman costs a lot of money. For a bureau, the total cost might be around £12,000 for the salesman (guarantee, car, overheads etc) plus the profit that should have been made on the new business he should have got but didn't, say 20% on £20,000, giving an approximate total cost of £22,000.

For a hardware manufacturer, where salesmen are typically paid more and expected to achieve more, the total figure might be around £30,000.

Beware of one particular type of candidate: the one who looks almost too good for the job; the mature experienced salesman oozing charisma and articulation.

These candidates typically arrive with an immaculate curriculum vitae. They are well presented, with considerable presence, and an impressive knowledge of the computer industry in terms of products and personalities. They are first class communicators with an apparently good track record. They appear to have a complete understanding of your marketplace and products, and they turn the interview into a good sales call with a good opening and a positive "close".

Yet in reality they have achieved little or nothing for past employers and will almost certainly do the same for you. Call them "guarantee hoppers", "easy riders" or what you will. They are, in fact, a considerable hazard for senior management who have had insufficient exposure to this type of salesman.

The reason why they survive, and will continue to do so, is twofold. Firstly, the computer industry is expanding so fast that it is able to sustain both the incompetent and the inadequate. Secondly, there is no proven interviewing technique for quantifying such old fashioned qualities as industry, integrity, initiative and self-motivation.

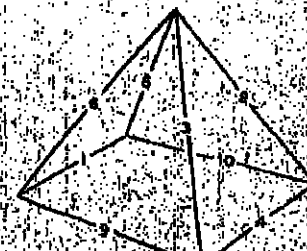
Most of the methods for assessing the individual salesman only come from considerable exposure to the sales and marketing arena. However, one positive clue to a candidate's real capability is the nature of his chosen referees. If they are not direct superiors within his present or previous job, be on your guard. You would be surprised how many failed salesmen quote vicars, Members of Parliament and pearl-divers.

Once you have decided to offer a job to a candidate, be sure to agree pertinent referees and follow them up. If you can take up some additional references of your own, so much the better.

Remember the golden rule, when in doubt, don't. So you are under pressure from your boss and you are below sales complement. Don't let yourself or your company be forced into risk situations. Choosing the wrong salesman costs a lot of money. For a bureau, the total cost might be around £12,000 for the salesman (guarantee, car, overheads etc) plus the profit that should have been made on the new business he should have got but didn't, say 20% on £20,000, giving an approximate total cost of £22,000.

For a hardware manufacturer, where salesmen are typically paid more and expected to achieve more, the total figure might be around £30,000.

Puzzle answer



TRADER

Supplies Ltd